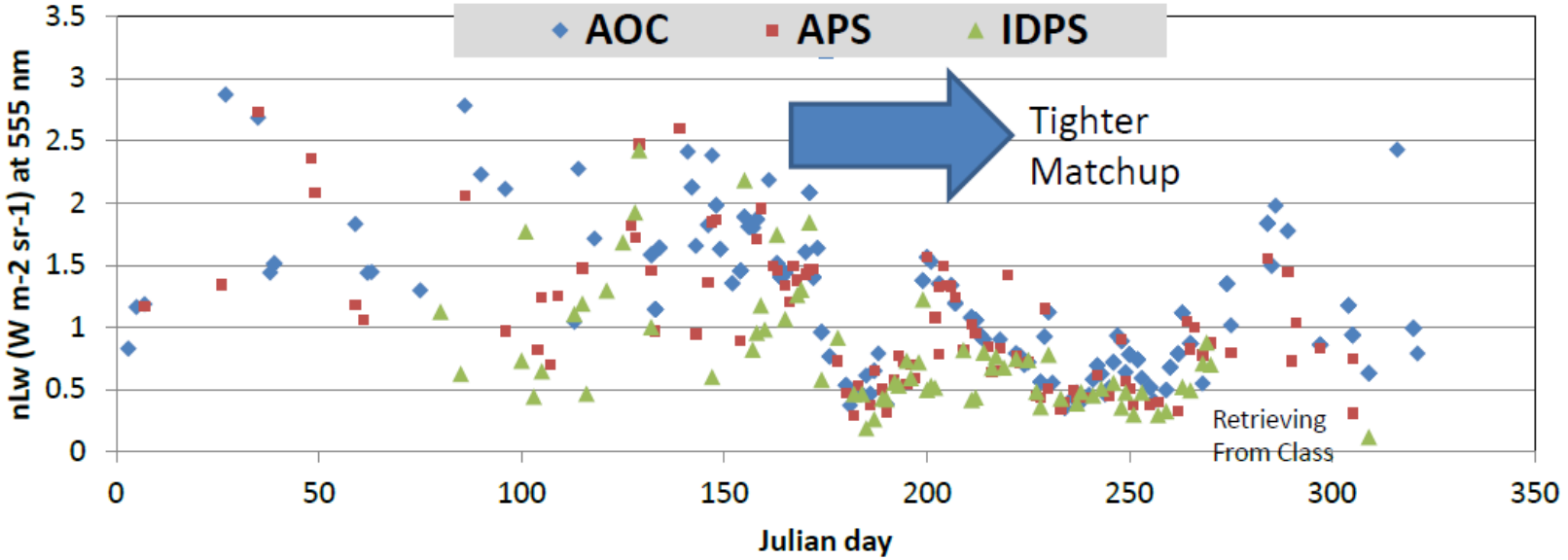
AAOT 555nm nLw Time Series 2013 Adriatic Sea



Location: AAOT (Jan1 – Nov 20)	# data records	# data records after exclusions applied	# data records after satellite flags
SeaPrism AOC	686	382	382
APS –processing	233	93	73
VOCCO – processing	314	143	143
APS to SeaPrism matchups	116	44	35
VOCCO to SeaPrism matchups	68	46	46
APS to VOCCO matchups *	173	55	46

Exclusion Criteria: +/- 3hrs; Max SatZA = 56°; Max SolZA = 70°; 50% valid pixels; wind < 8m/s; max AOT 0.2

Satellite Flags: Atmos fail; High LT; cloud/ice; sea ice; low nLw; land; hi satZ; hi solZ; nav fail, High glint; max AER iteration, epsilon out of range; Moderate glint

**the APS to VOCCO matchups are not screened for wind speed or any of the in situ parameters.*

Gains
No Vical

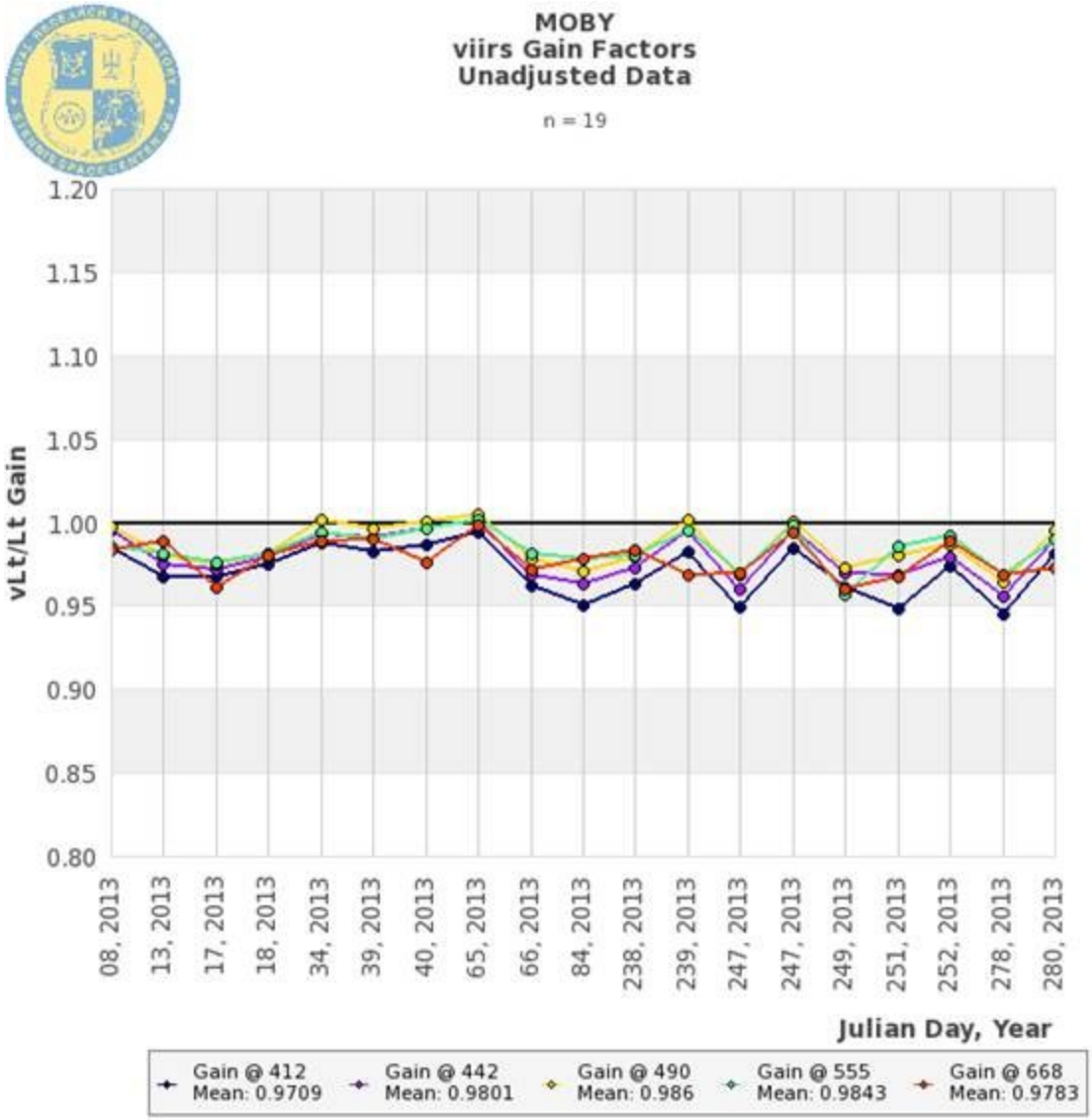


Figure 2 shows the vLt/Lt over time using unity gains. In a perfect system in which all components are computed accurately, the original Lt and vicarious Lt should have a ratio of 1.0. Most of the ratios are below the 1.0 line suggesting the sensor without vicarious calibration is slightly high. The mean gain for the 412, 442, 490, 555, and 668 channels are 0.9709, 0.9801, 0.9860, 0.9843, and

Gains
with Vical

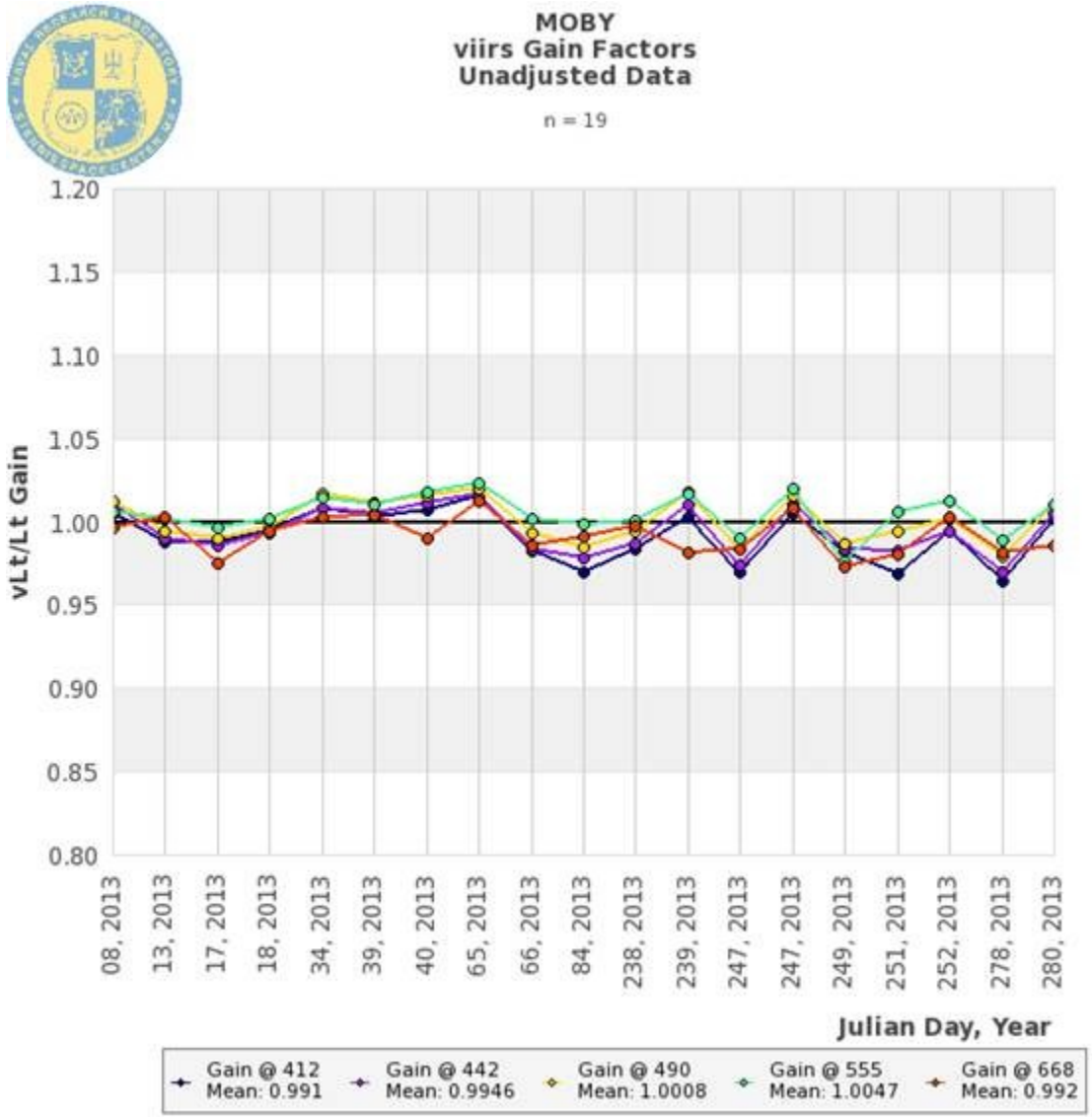
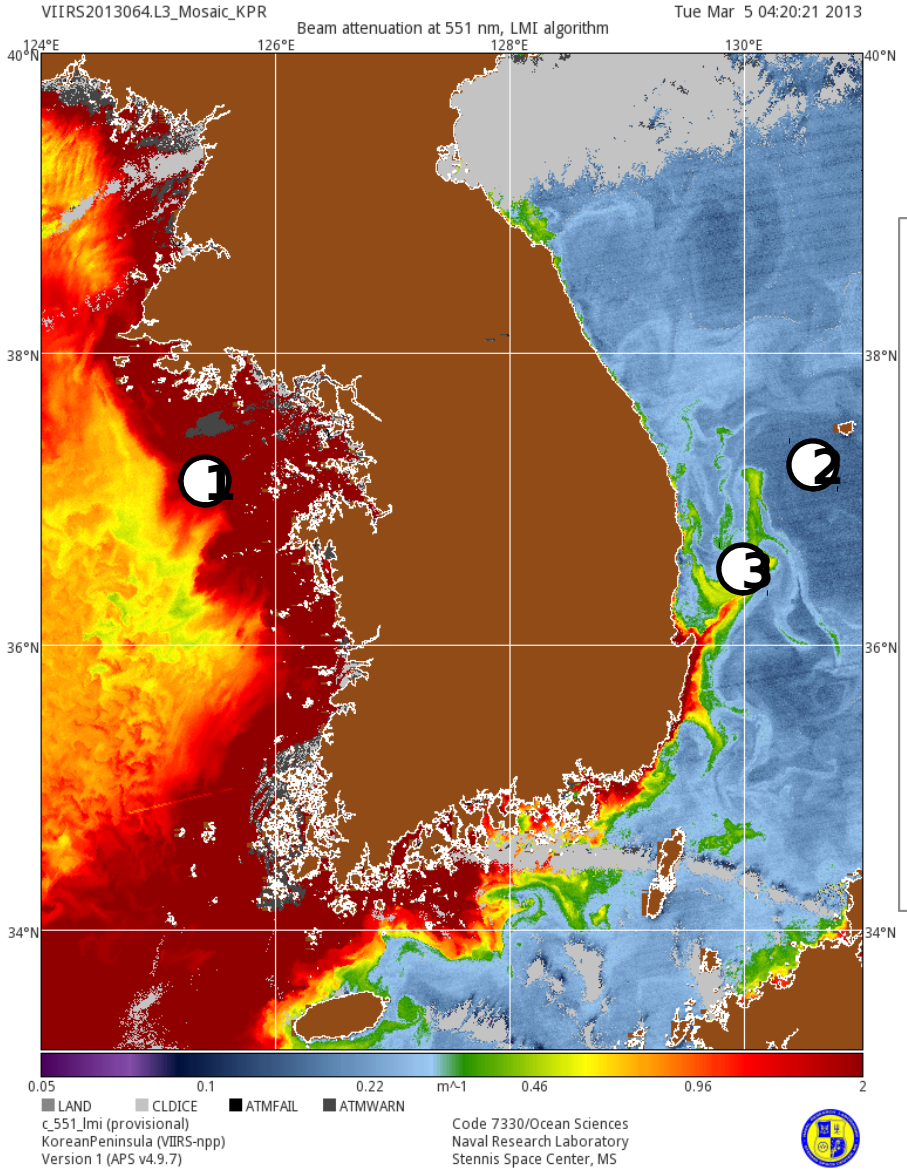
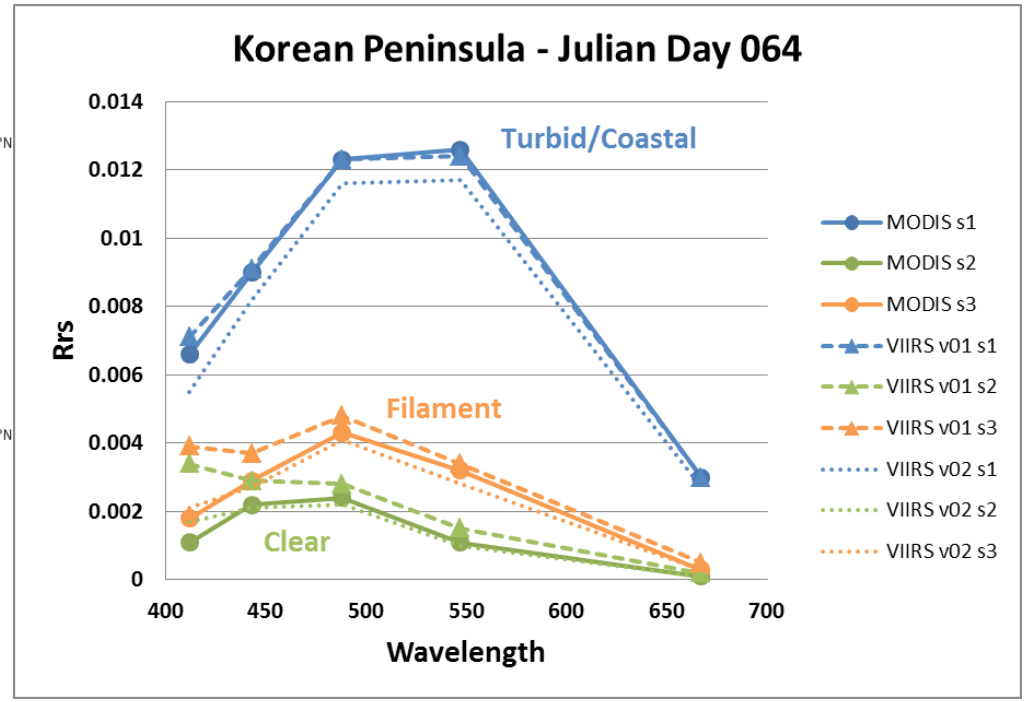


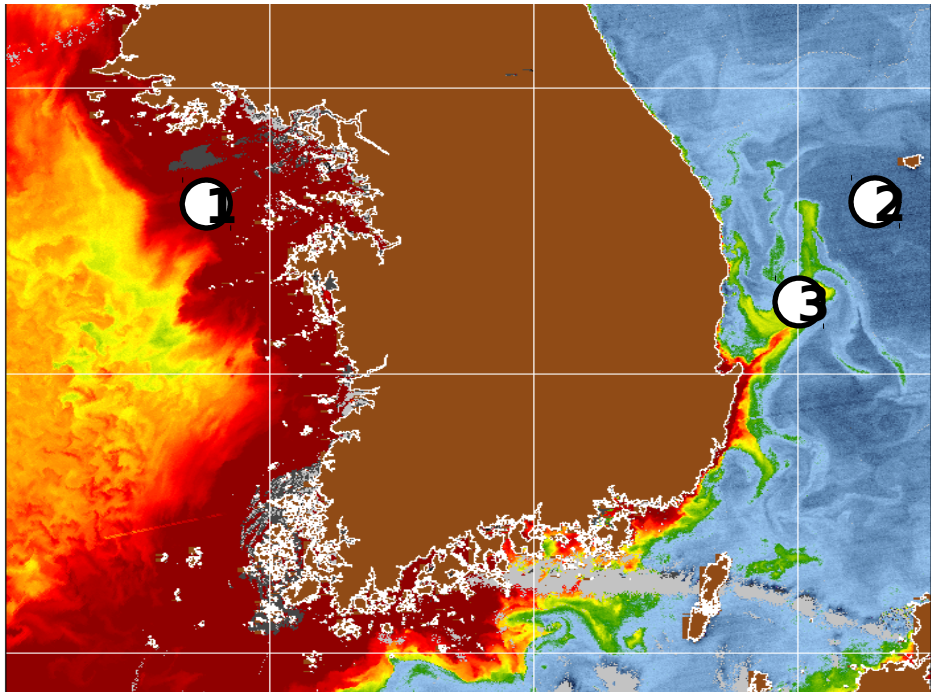
Figure 3 shows the vLt/Lt relationship over time by processing the MOBY imagery with the vicarious calibration coefficients. The ratios vary around the 1.0 line suggesting the sensor with vicarious calibration is on average performing better than it does with unity gains. The mean gain for the 412, 442, 490, 555, and 668 channels are 0.9910, 0.9946, 1.0008, 1.0047, and 0.992 respectively.

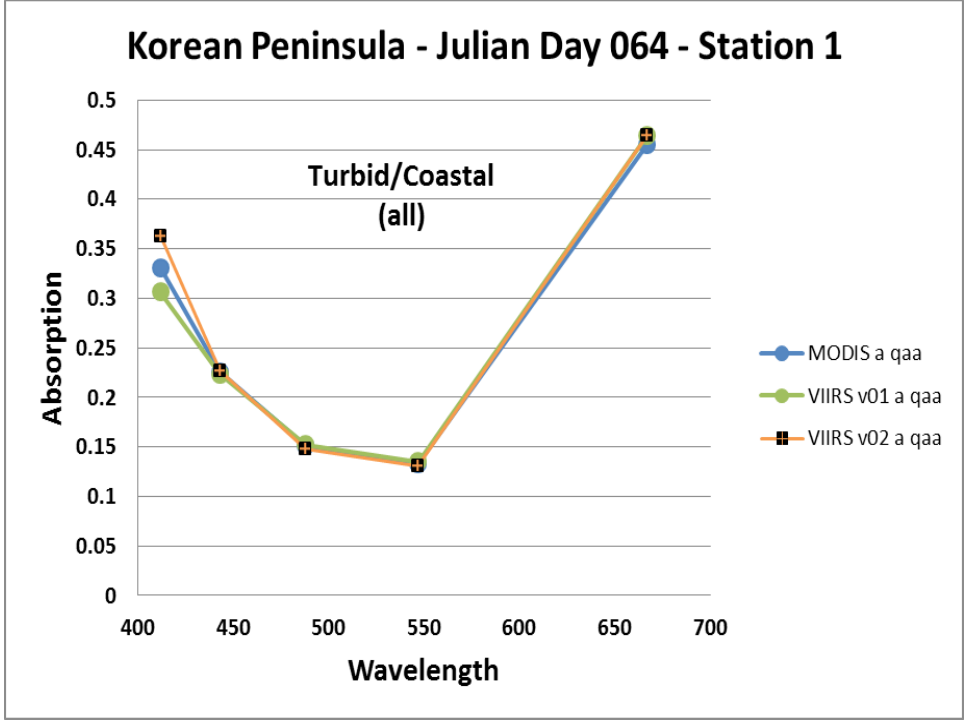
Korean Peninsula – March 5, 2013 – QAA vs LMI – MODIS vs VIIR
AOPS v4.10

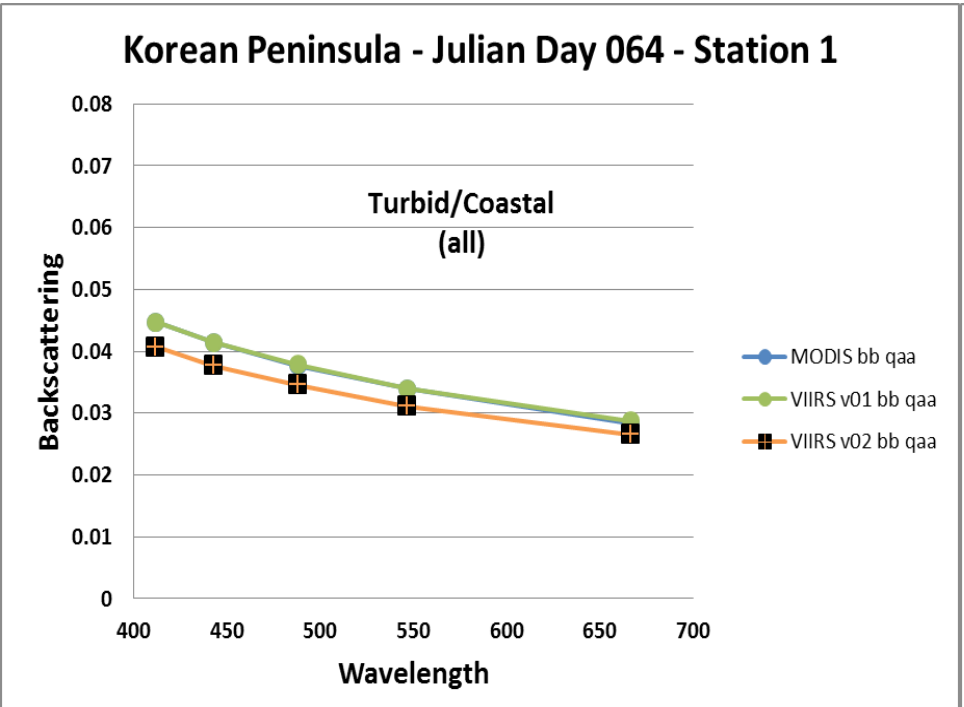


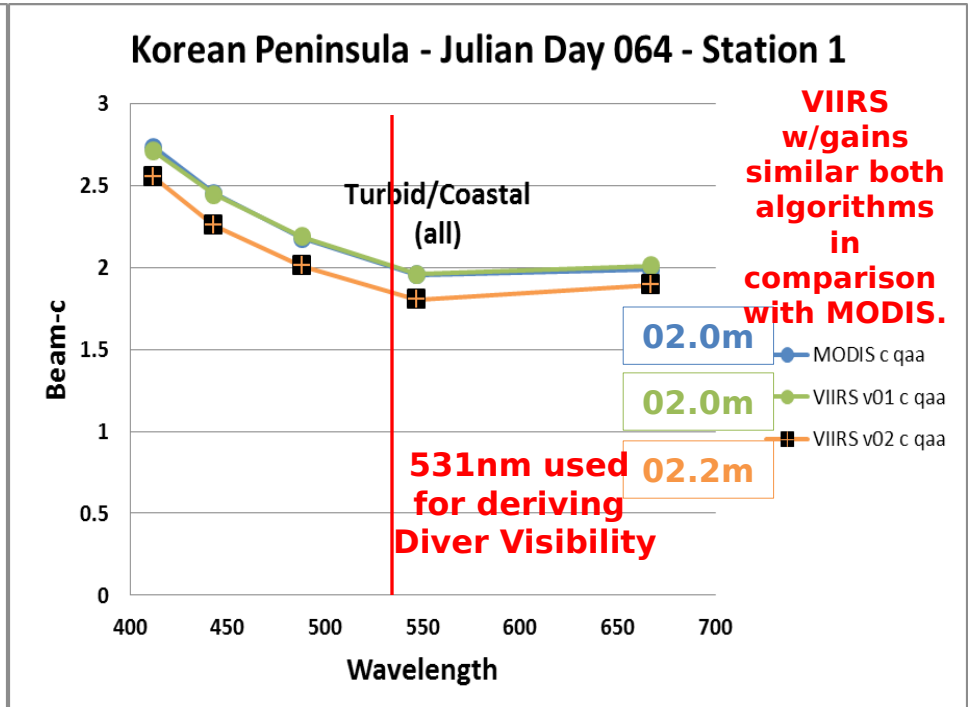
VIIRS(gains) vs, MODIS Rrs improvement at stations 2 & 3 in comparison to MODIS

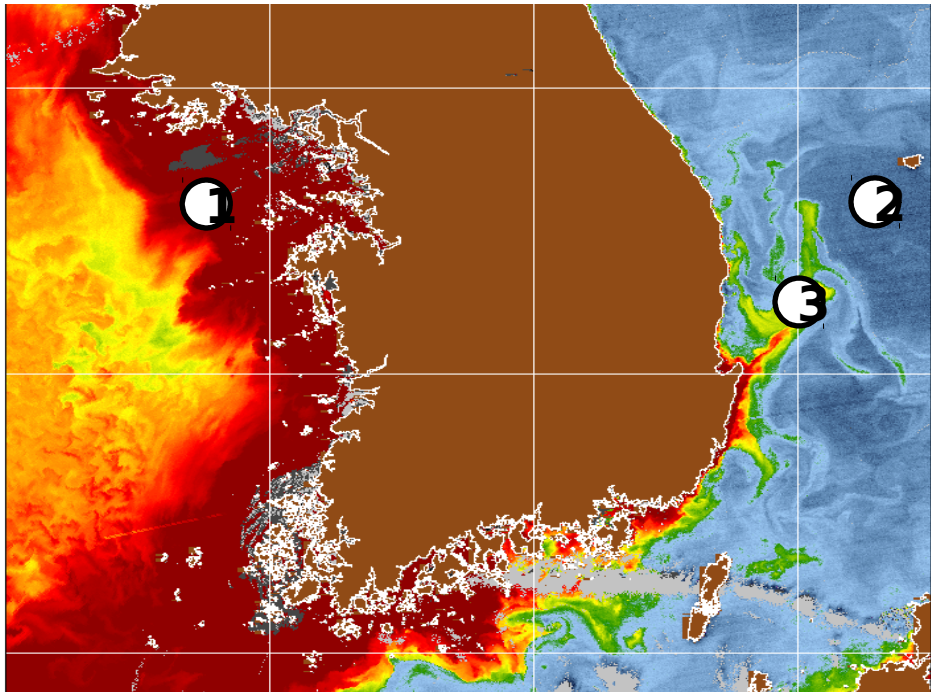


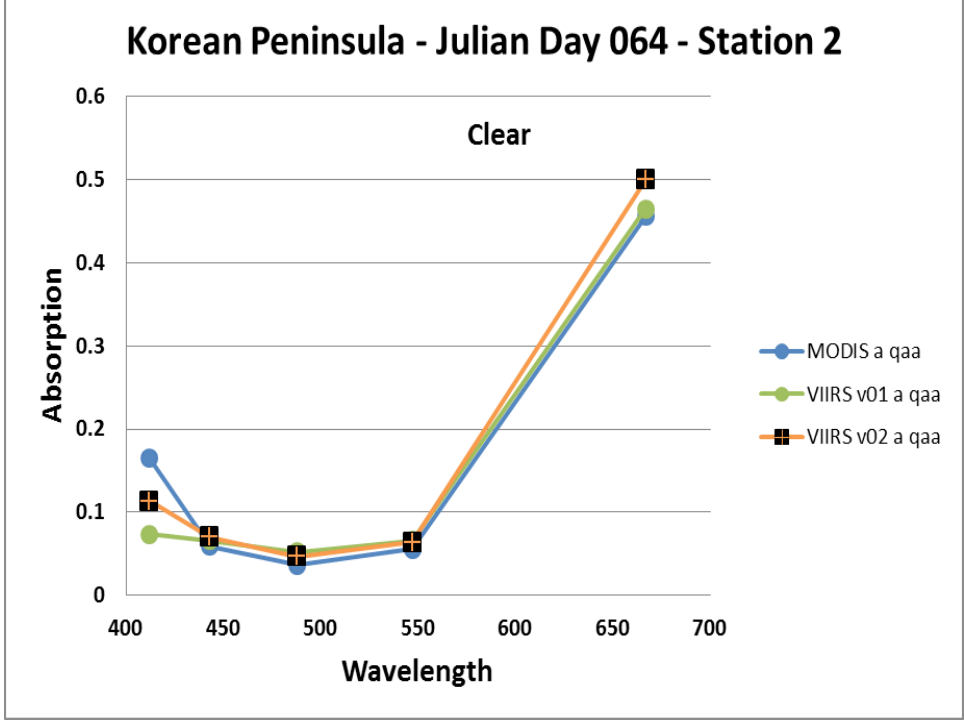

1
2
3

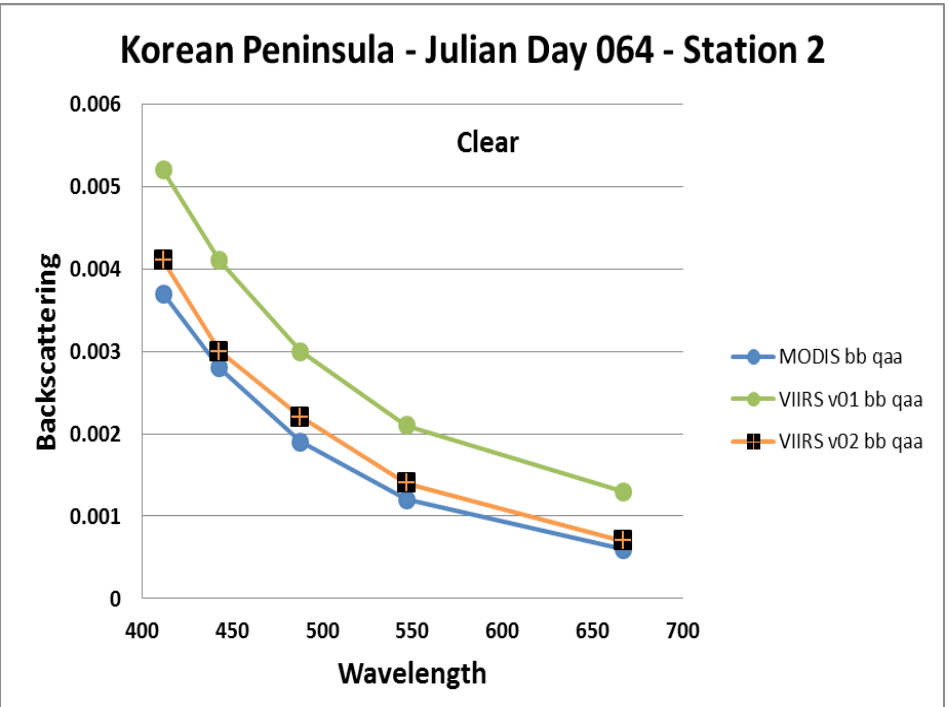

Korean Peninsula - Julian Day 064 - Station 1
Turbid/Coastal
(all)
Absorption
Wavelength
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
400
450
500
550
600
650
700
MODIS a qaa
VIIRS v01 a qaa
VIIRS v02 a qaa

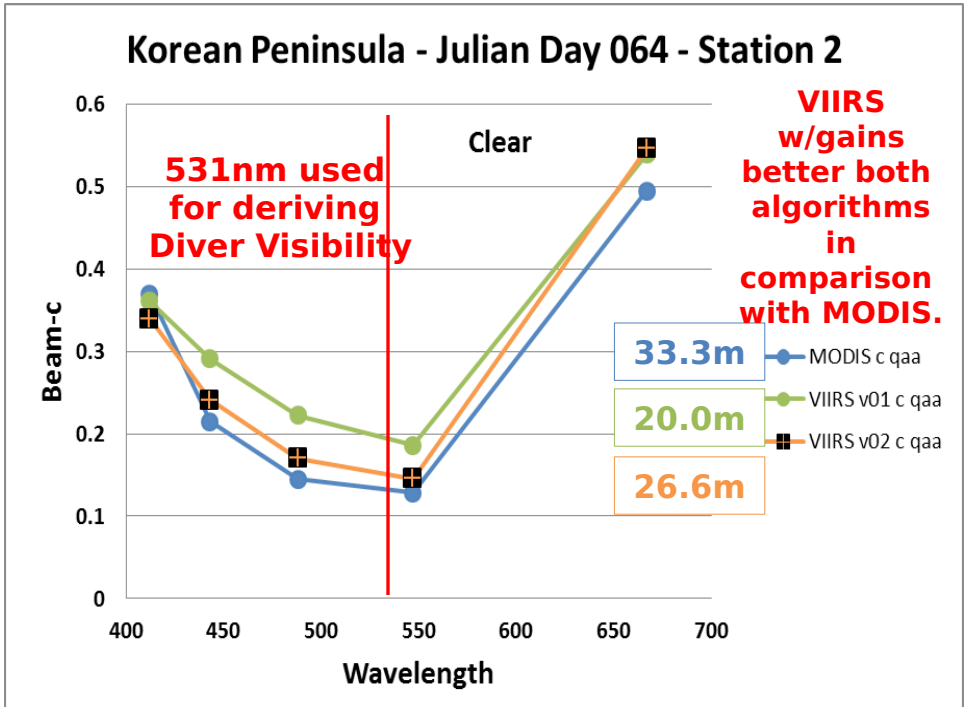

Korean Peninsula - Julian Day 064 - Station 1
Turbid/Coastal
(all)
Backscattering
Wavelength
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
400
450
500
550
600
650
700
MODIS bb qaa
VIIRS v01 bb qaa
VIIRS v02 bb qaa

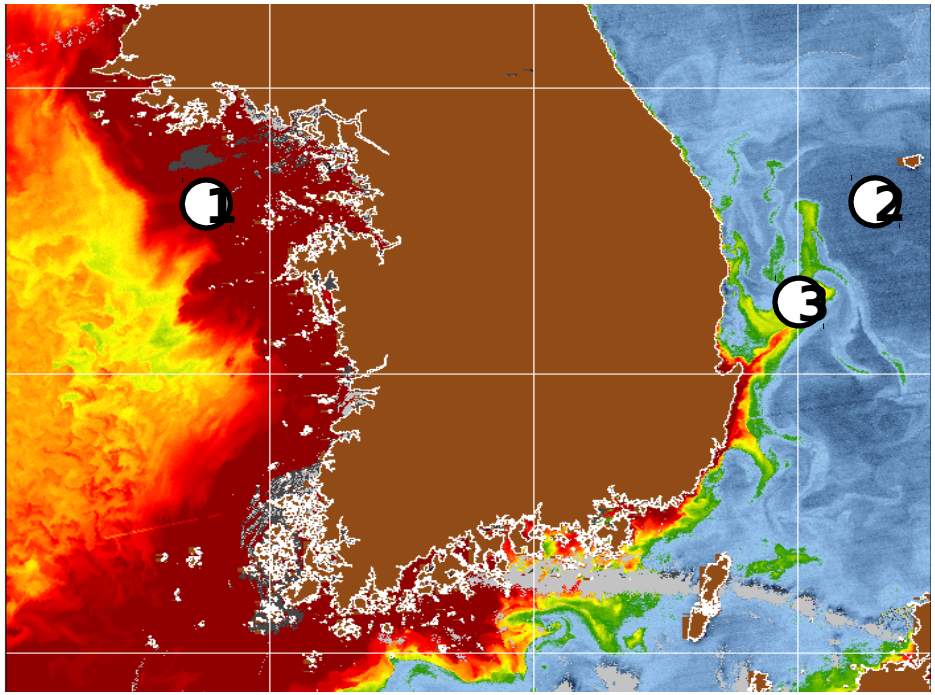

Korean Peninsula - Julian Day 064 - Station 1
Turbid/Coastal
(all)
Beam-c
Wavelength
3
2.5
2
1.5
1
0.5
0
400
450
500
550
600
650
700
MODIS c qaa
VIIRS v01 c qaa
VIIRS v02 c qaa
02.0m
02.0m
02.2m
531nm used
for deriving
Diver Visibility
VIIRS
w/gains
similar both
algorithms
in
comparison
with MODIS.

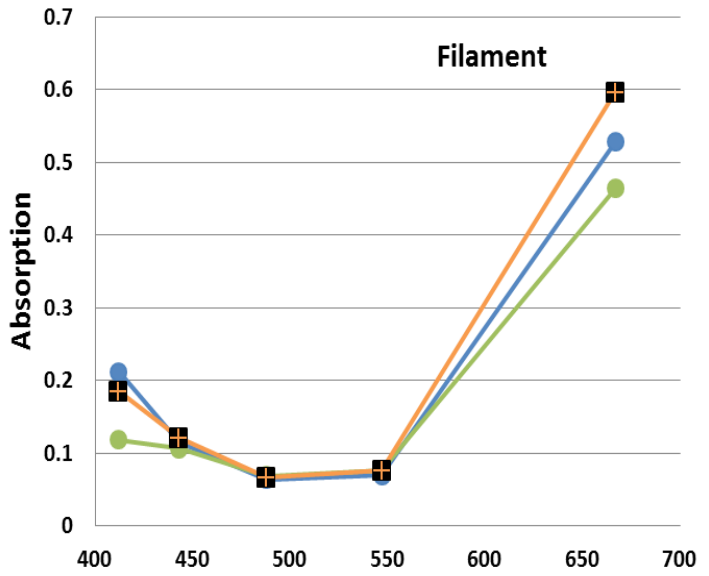

1
2
3

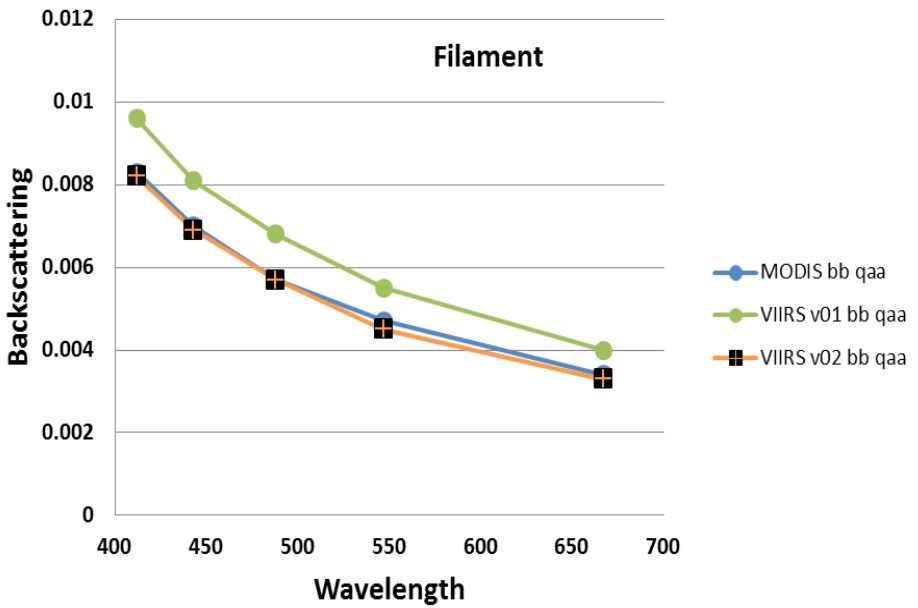

Korean Peninsula - Julian Day 064 - Station 2
Clear
Absorption
Wavelength
0.6
0.5
0.4
0.3
0.2
0.1
0
400
450
500
550
600
650
700
MODIS a qaa
VIIRS v01 a qaa
VIIRS v02 a qaa

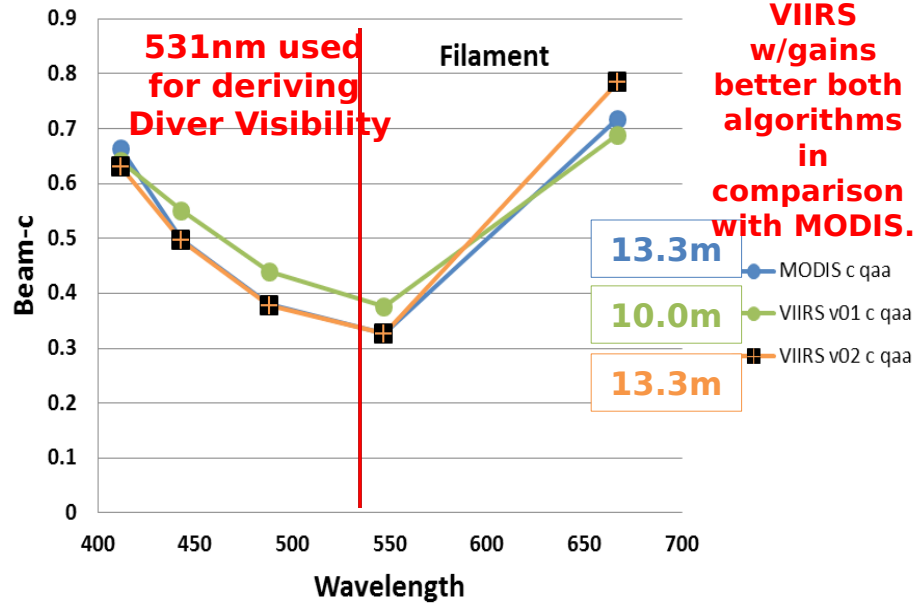

Korean Peninsula - Julian Day 064 - Station 2
Clear
Backscattering
Wavelength
0.006
0.005
0.004
0.003
0.002
0.001
0
400
450
500
550
600
650
700
MODIS bb qaa
VIIRS v01 bb qaa
VIIRS v02 bb qaa


Korean Peninsula - Julian Day 064 - Station 2
Clear
531nm used for deriving Diver Visibility
VIIRS w/gains better both algorithms in comparison with MODIS.
33.3m
20.0m
26.6m
Beam-c
Wavelength
0.6
0.5
0.4
0.3
0.2
0.1
0
400
450
500
550
600
650
700
MODIS c qaa
VIIRS v01 c qaa
VIIRS v02 c qaa

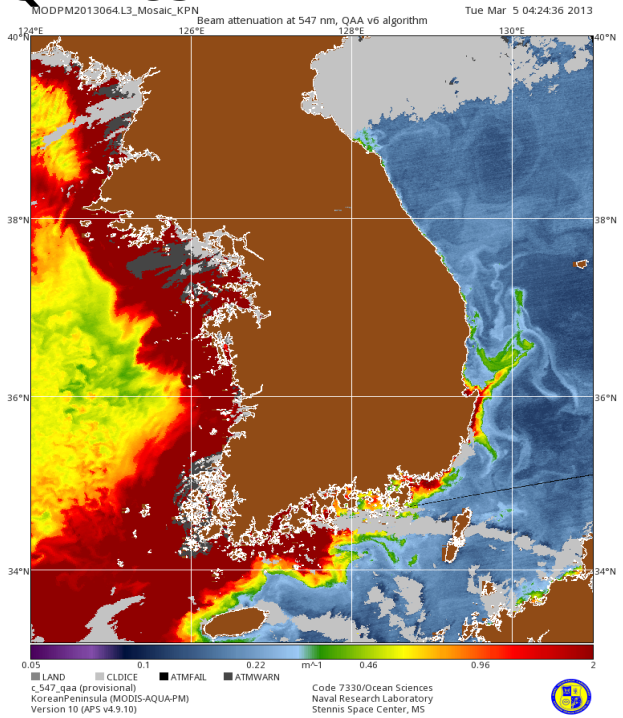

1
2
3


Korean Peninsula - Julian Day 064 - Station 3
Filament
Absorption
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
400
450
500
550
600
650
700
Wavelength
MODIS a qaa
VIIRS v01 a qaa
VIIRS v02 a qaa

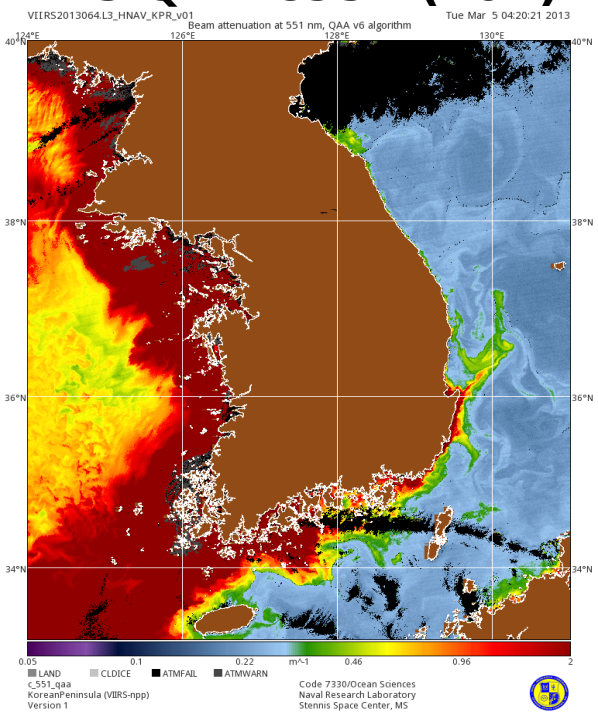

Korean Peninsula - Julian Day 064 - Station 3
Filament
Backscattering
0.012
0.01
0.008
0.006
0.004
0.002
0
400
450
500
550
600
650
700
Wavelength
MODIS bb qaa
VIIRS v01 bb qaa
VIIRS v02 bb qaa


Korean Peninsula - Julian Day 064 - Station 3
531nm used for deriving Diver Visibility
Filament
VIIRS w/gains better both algorithms in comparison with MODIS.
Beam-c
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
400
450
500
550
600
650
700
Wavelength
13.3m
10.0m
13.3m
MODIS c qaa
VIIRS v01 c qaa
VIIRS v02 c qaa

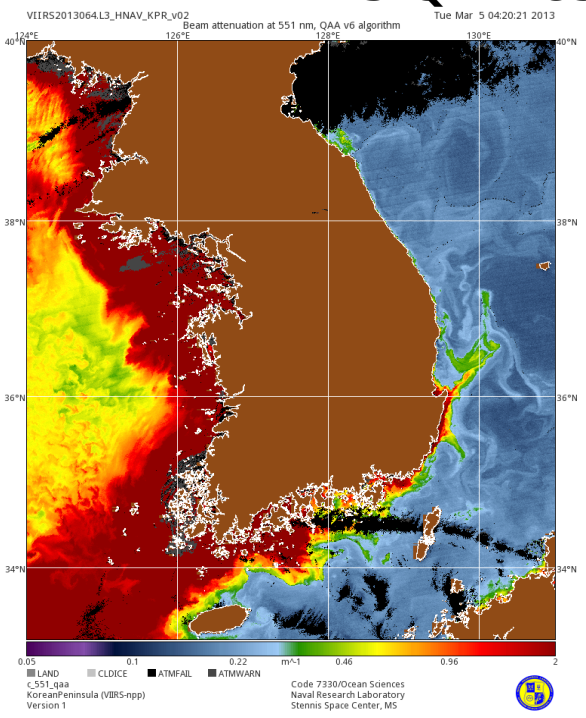
QAA c547



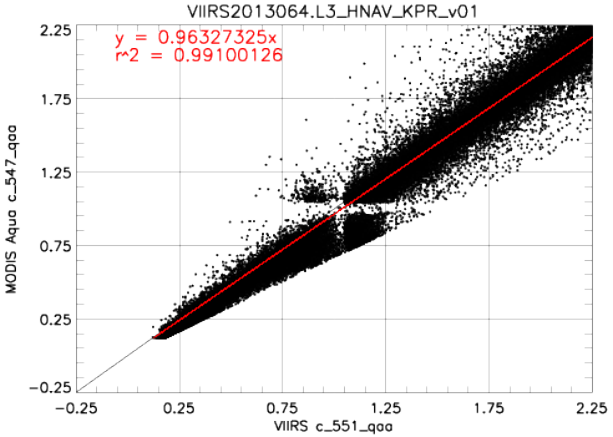
VIIRS QAA c551 (v01)

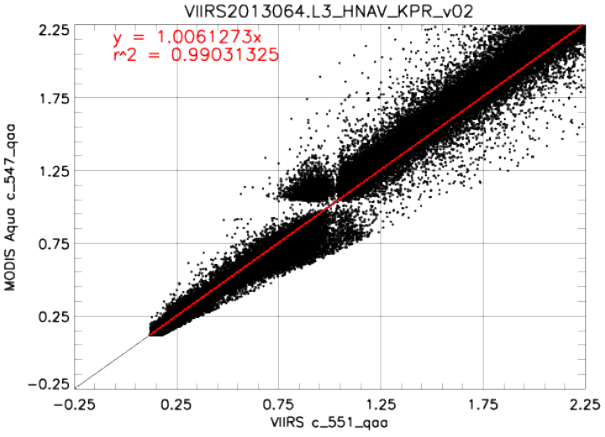


VIIRS QAA c551



Beam Attenuation

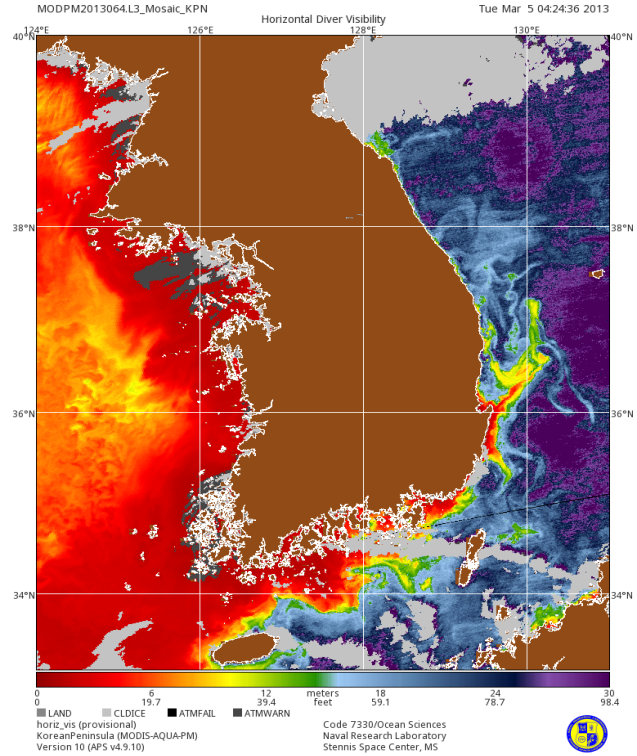


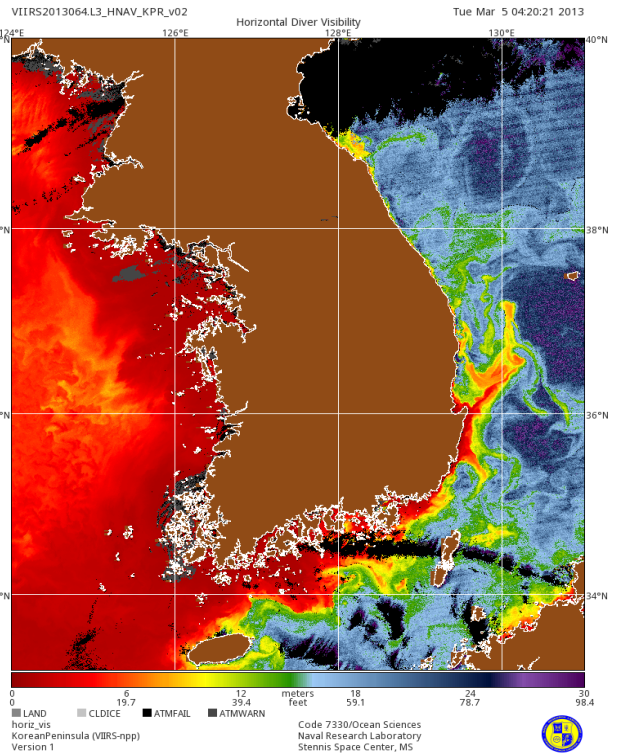


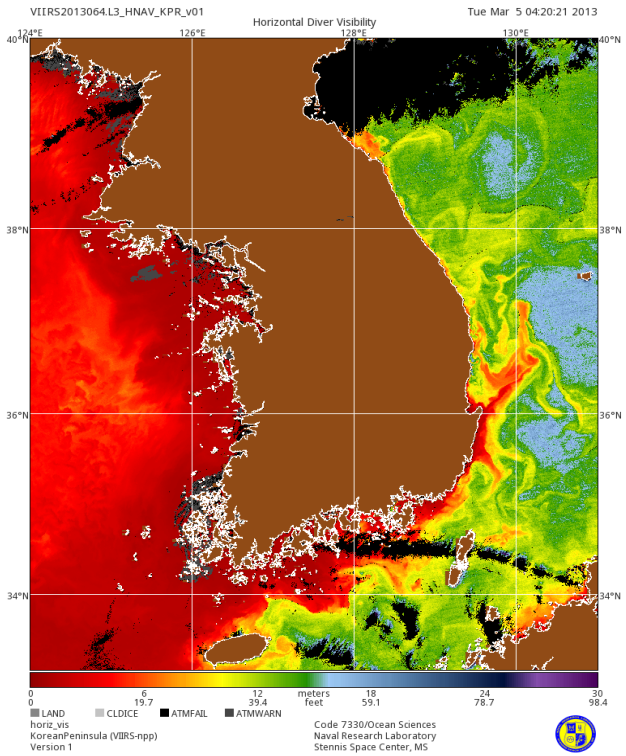
ODIS

VIIRS (v02)

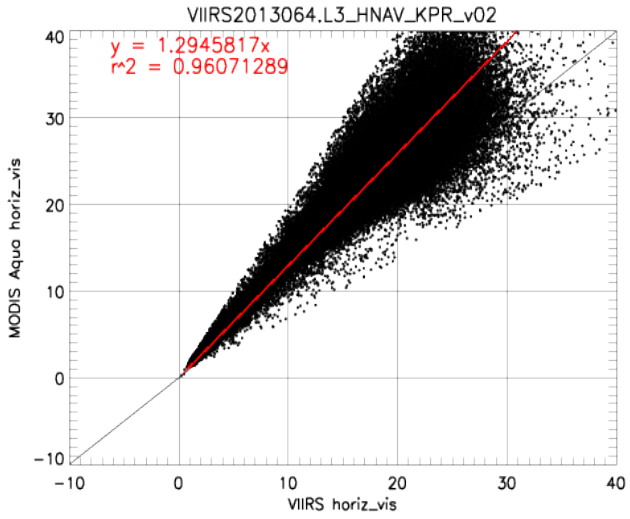
VIIRS

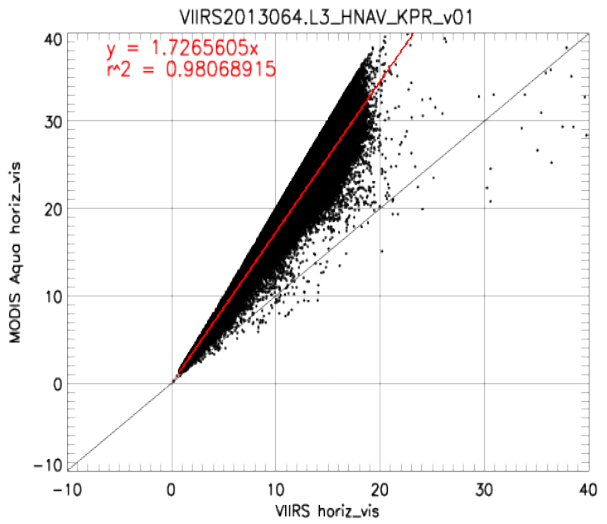






HORIZONTAL VISIBILITY (LMI 531)

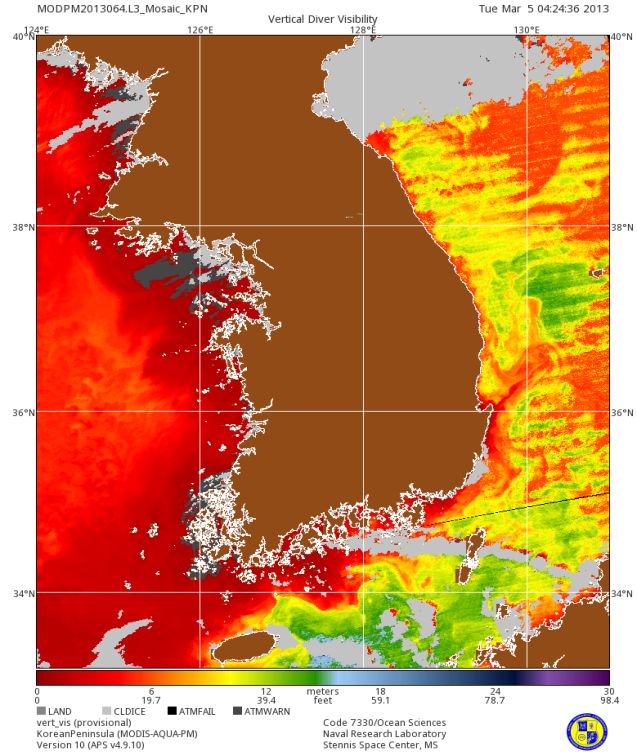


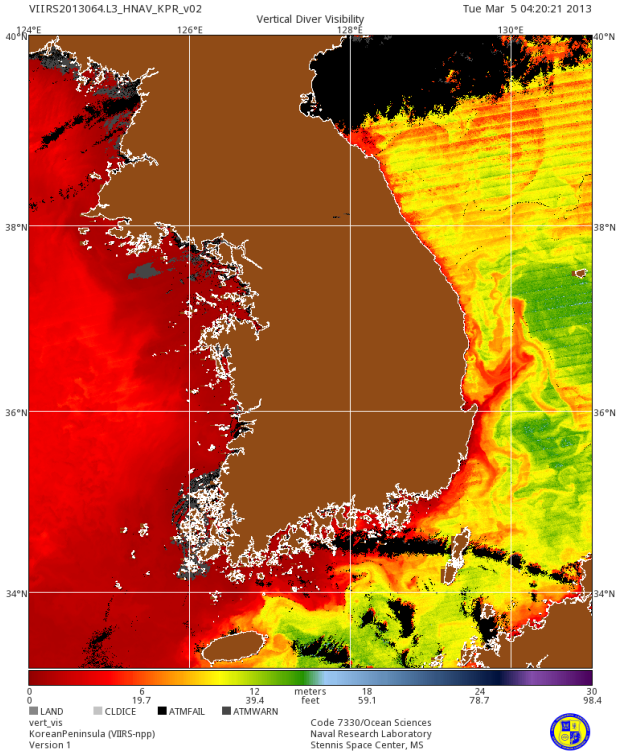


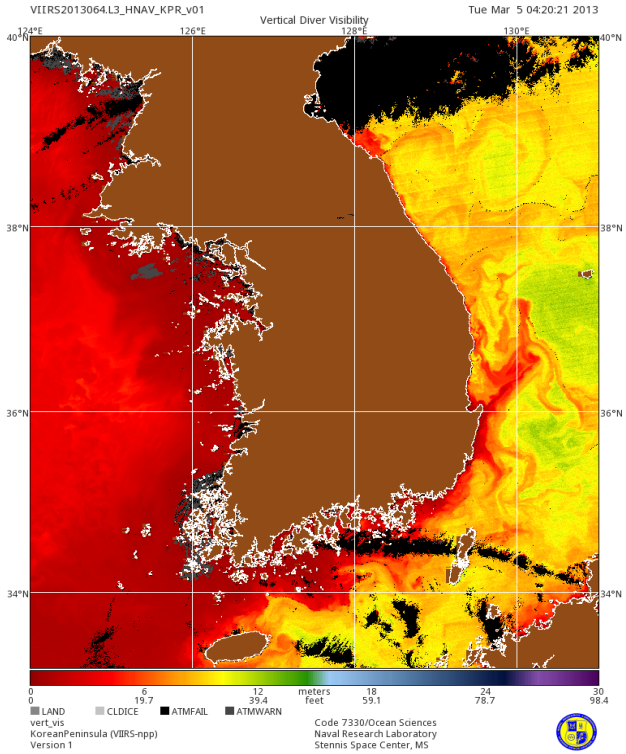
DIS

VIIRS (v02)

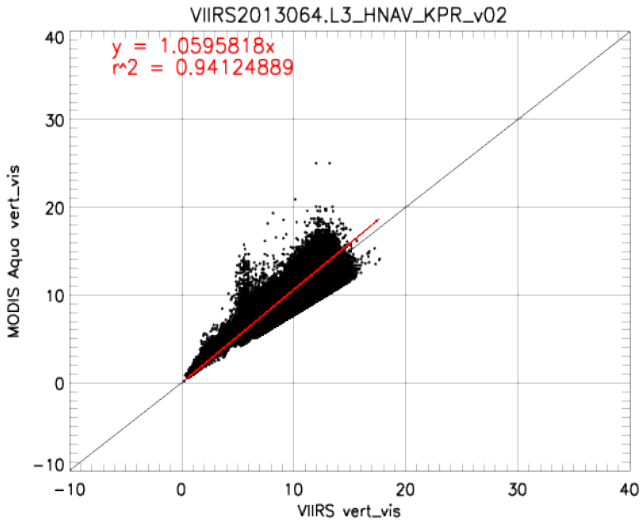
VIIRS

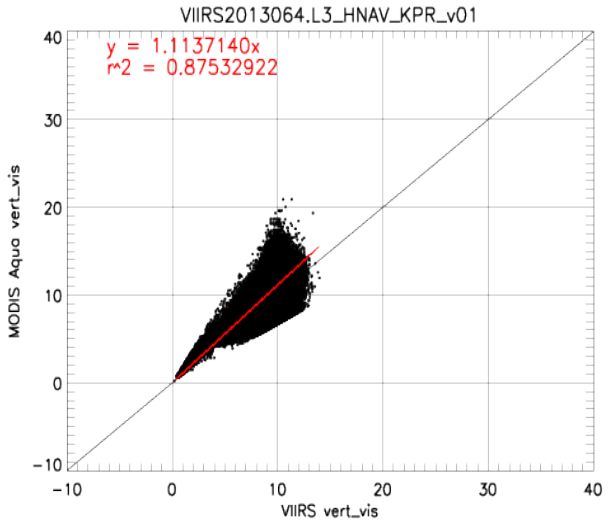




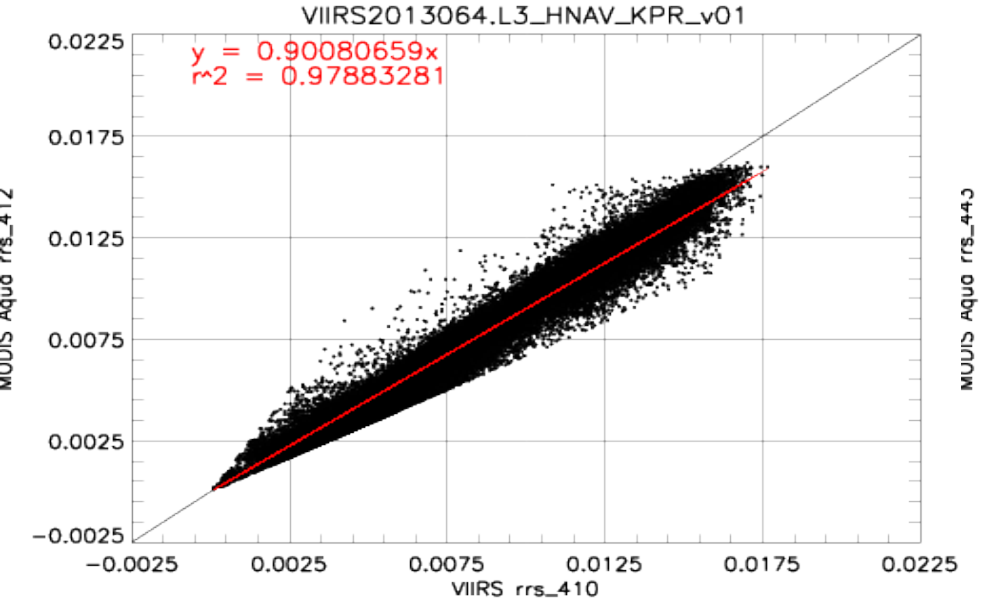


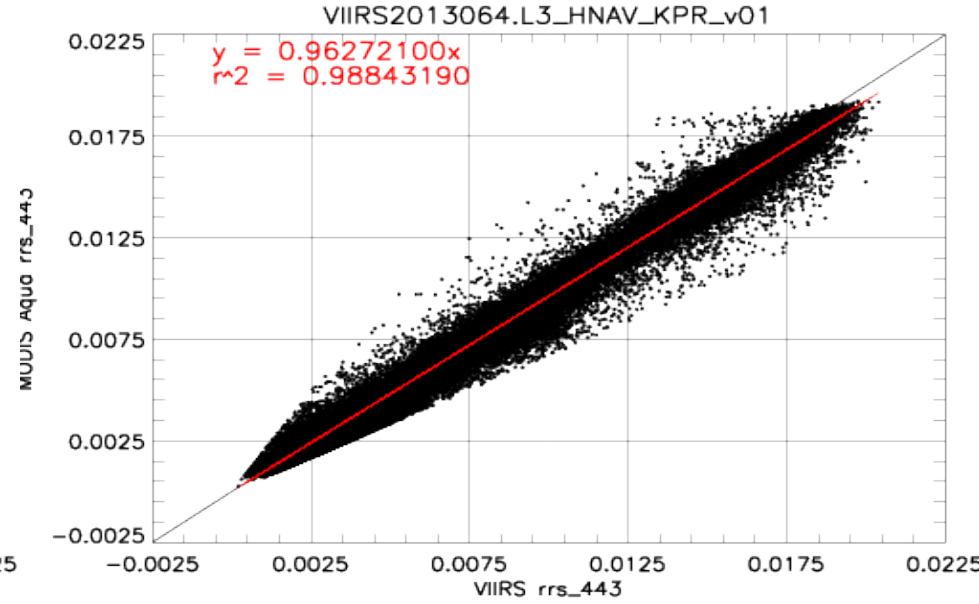
VERTICAL VISIBILITY (LMI 531)

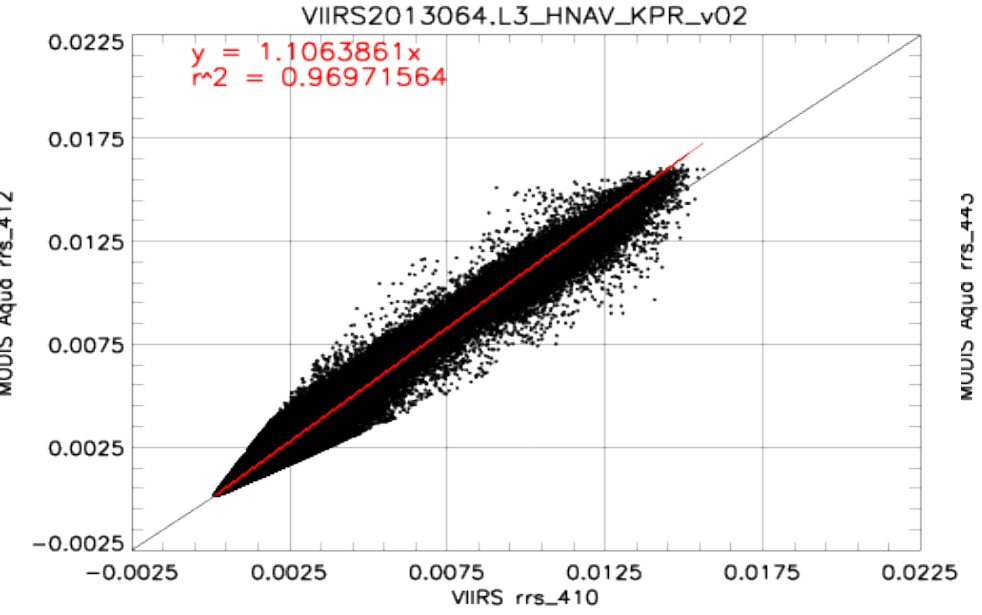


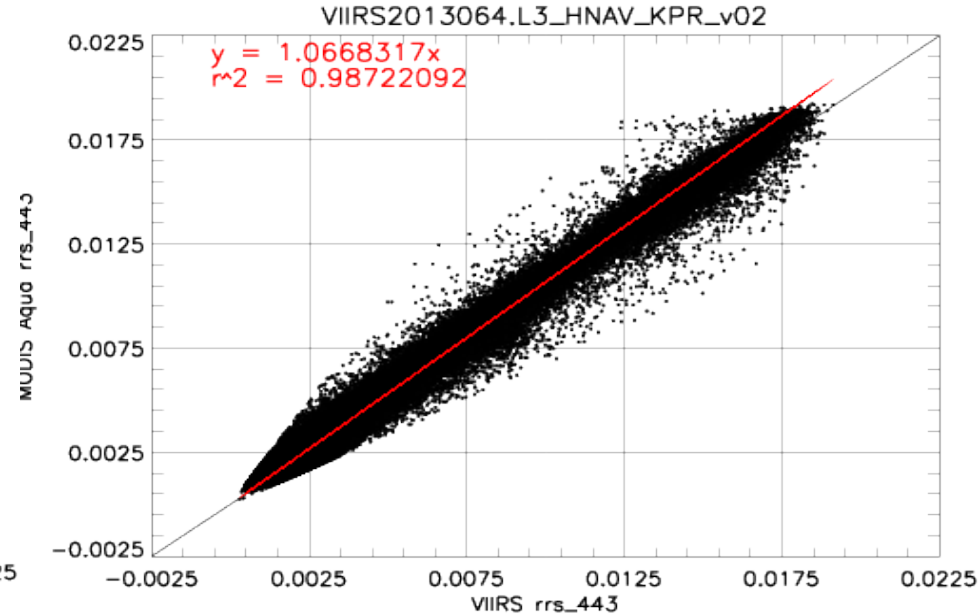


Rrs Matchup MODIS vs. VIIRS (412,443)

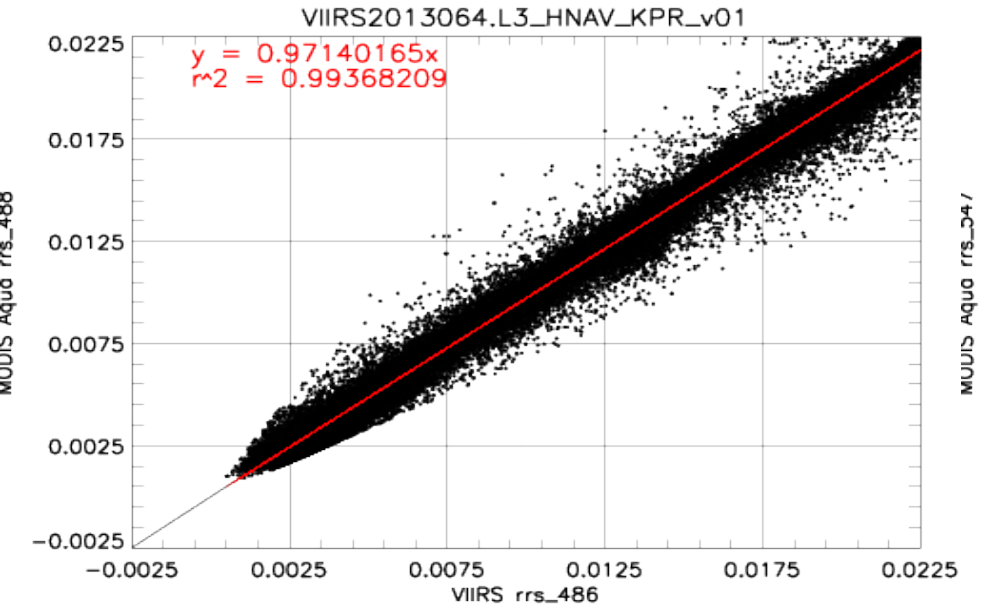


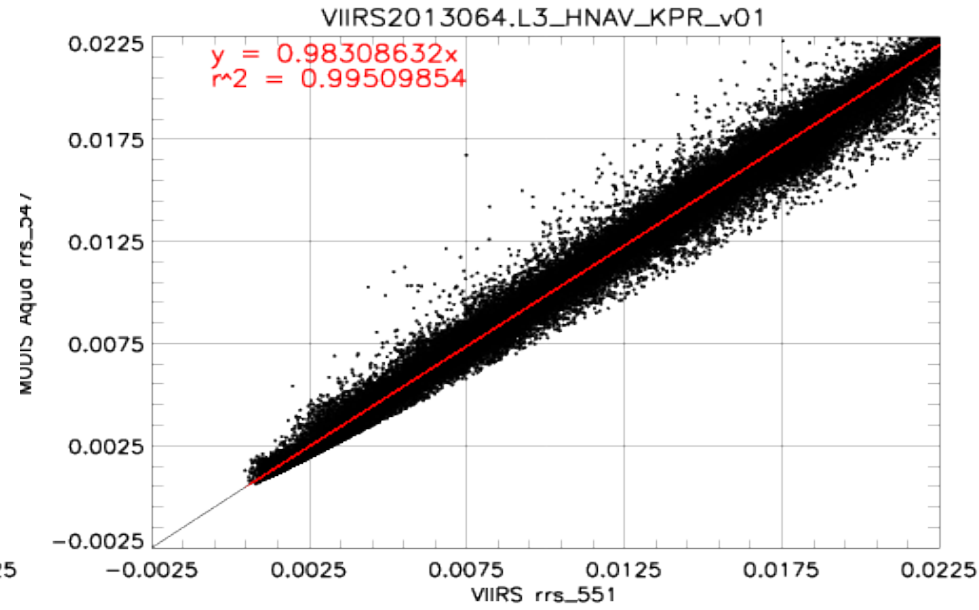


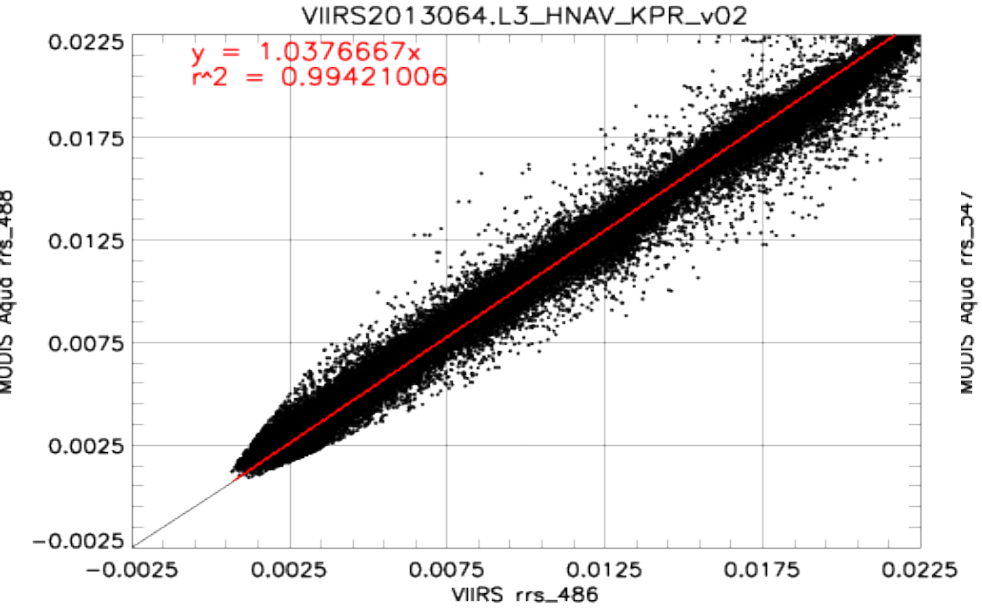


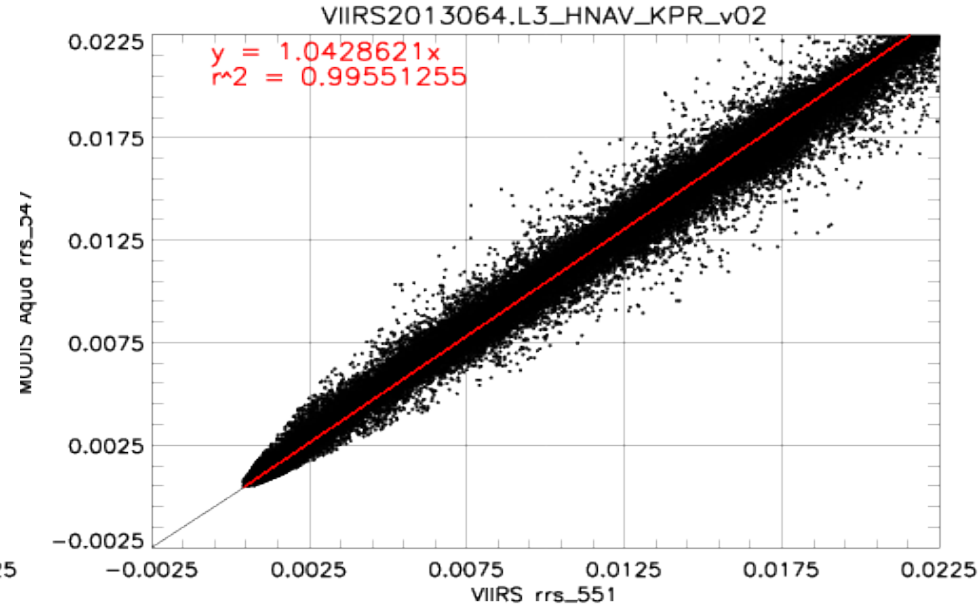


Rrs Matchup MODIS vs. VIIRS (488,451)

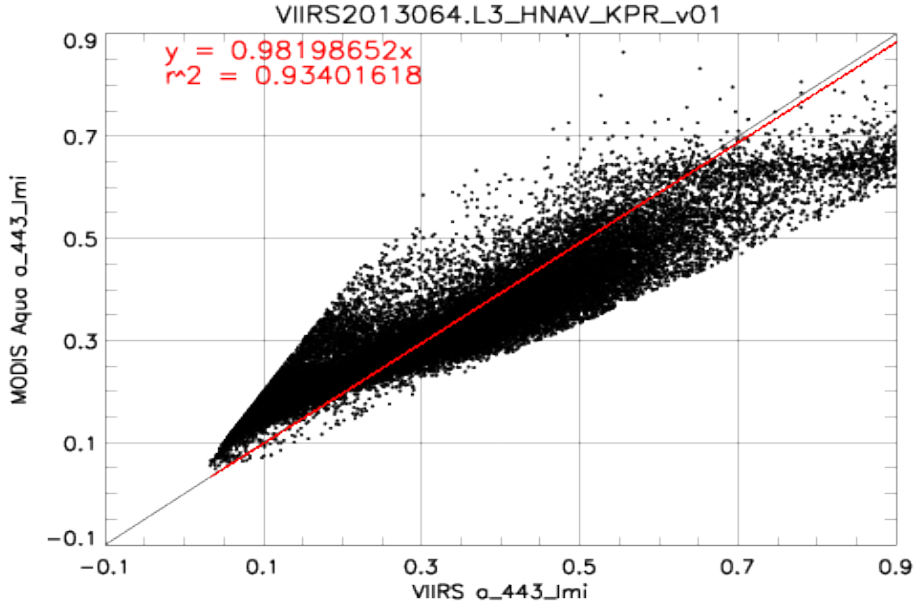


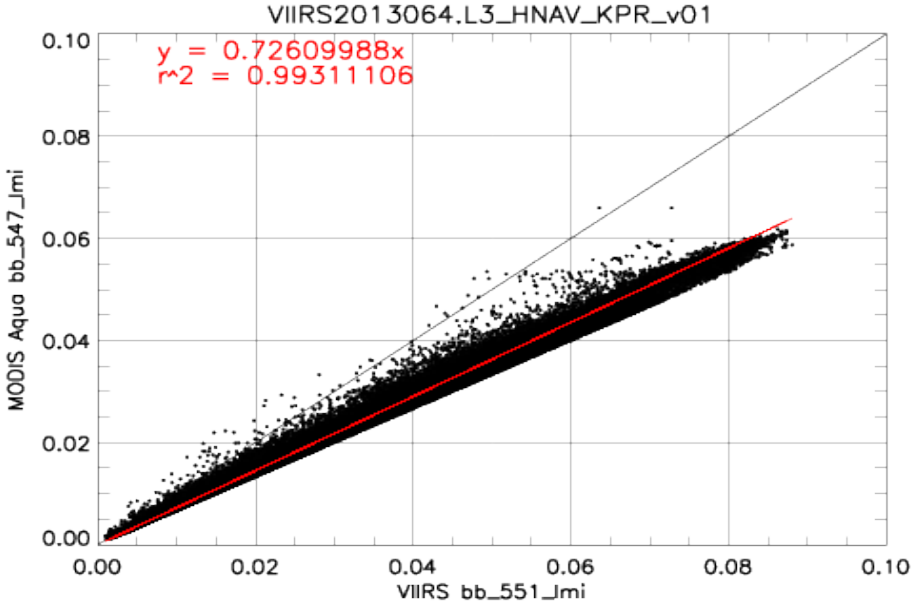


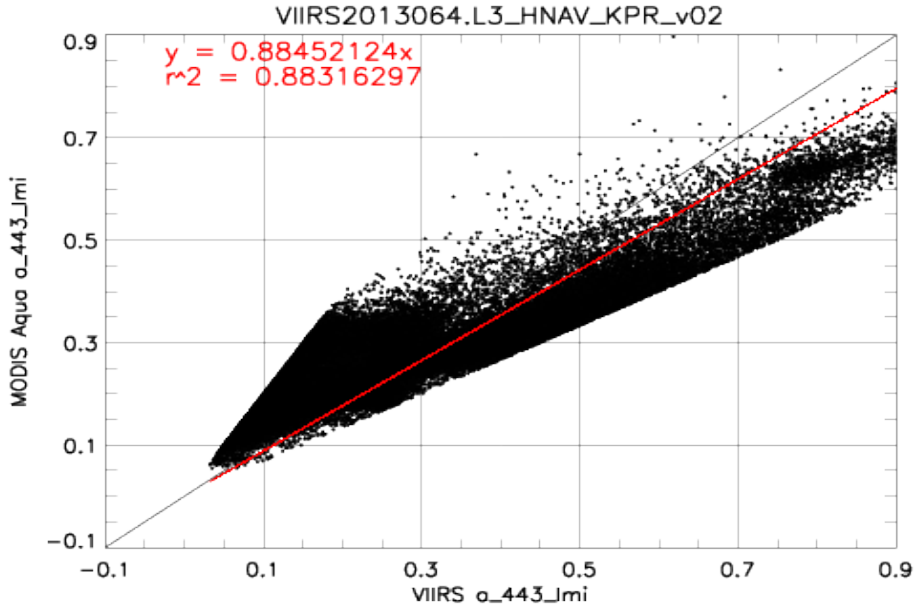


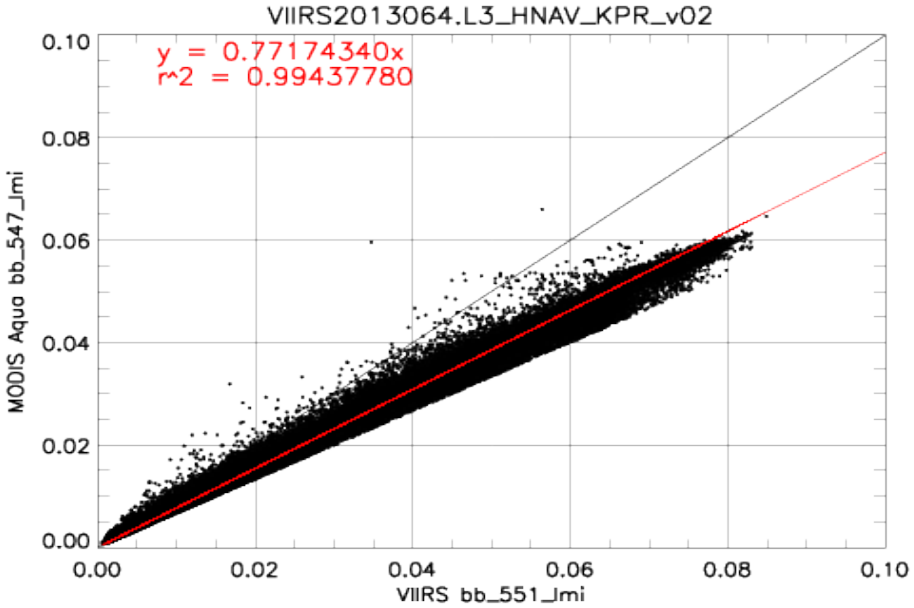


a,bb Matchup MODIS vs. VIIRS

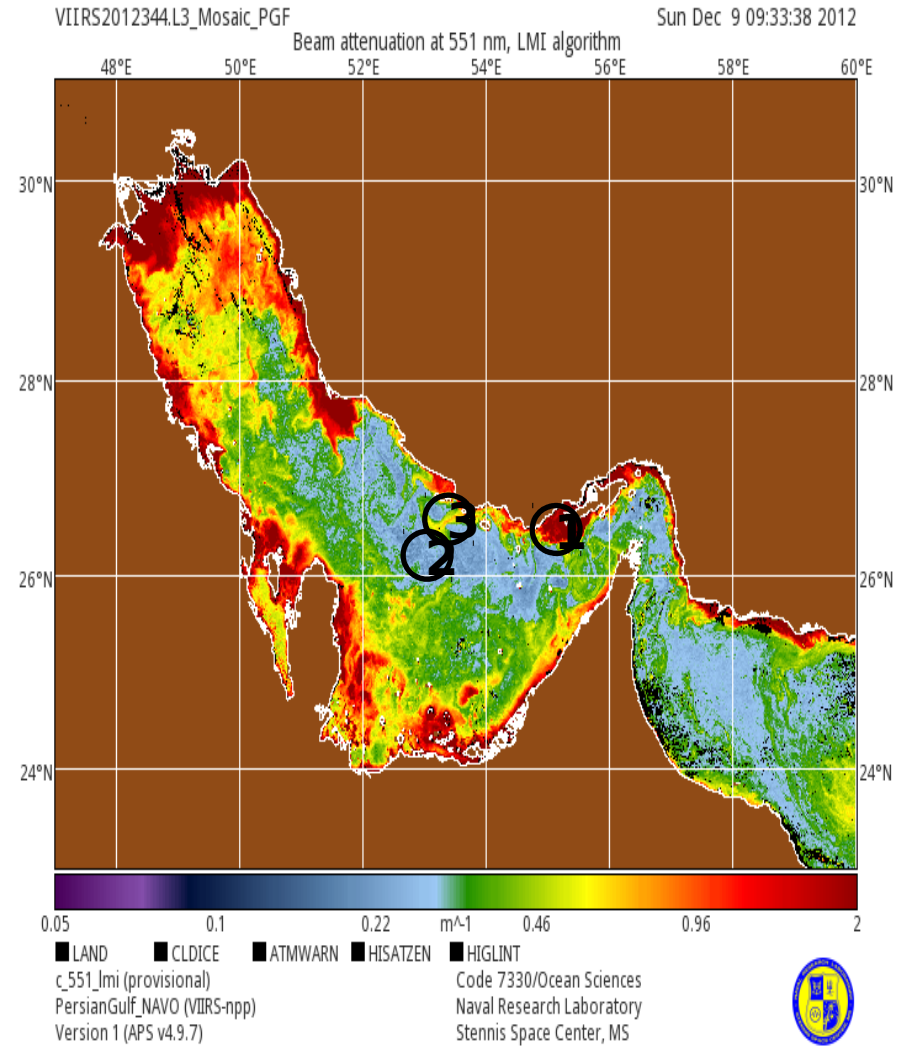




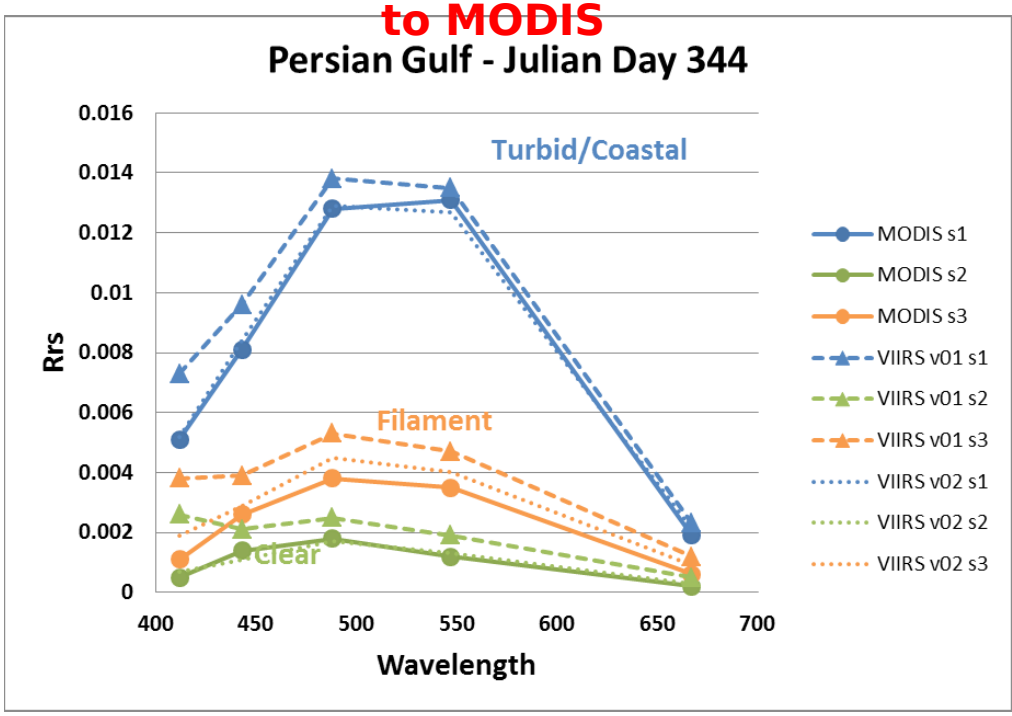


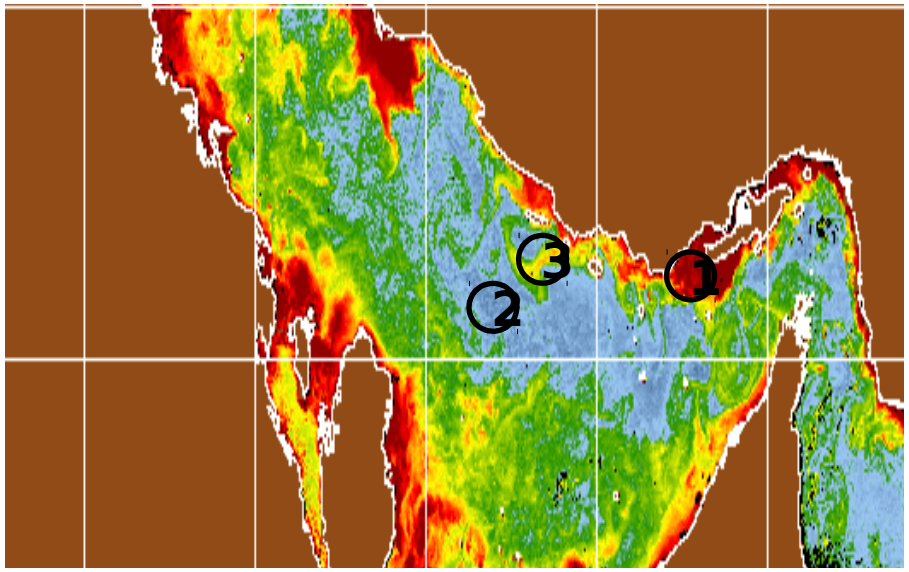


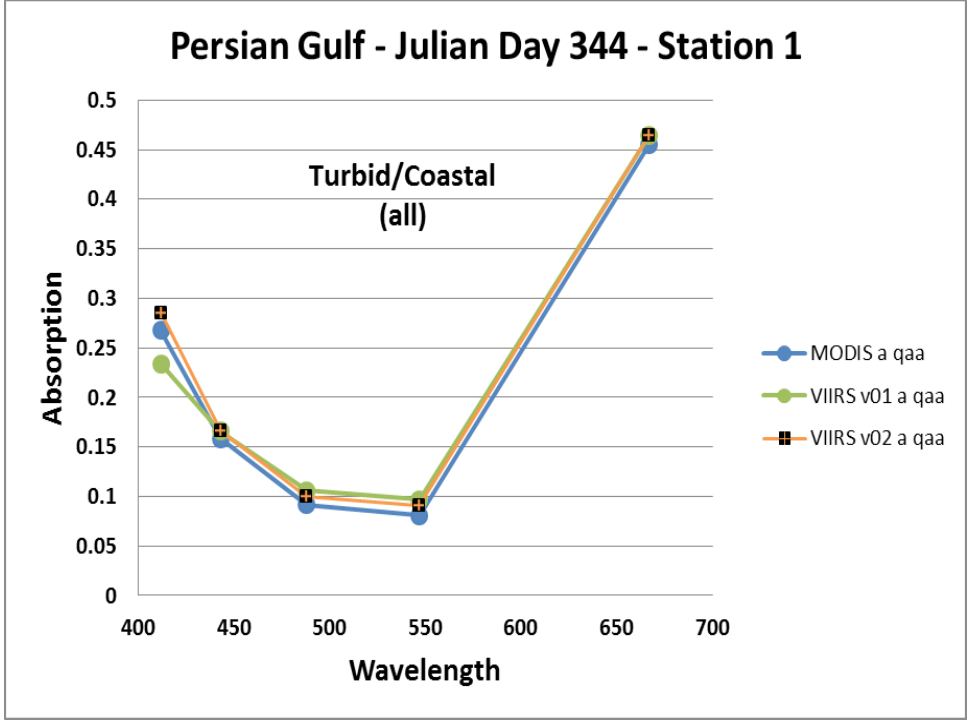
Persian Gulf – December 09, 2012 – QAA vs LMI – MODIS vs VIIRS

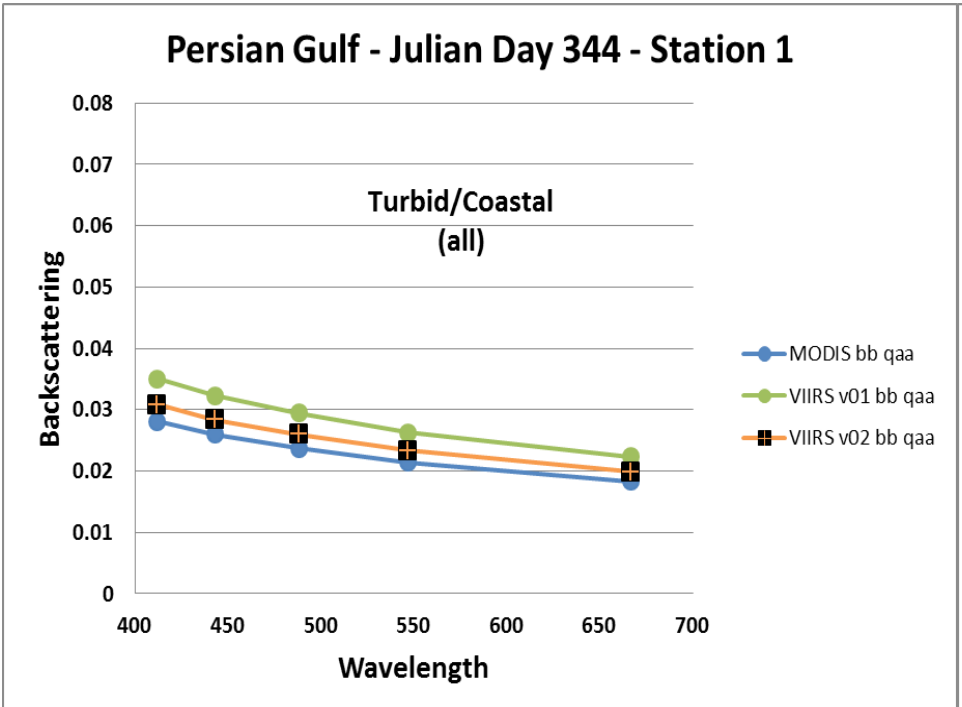


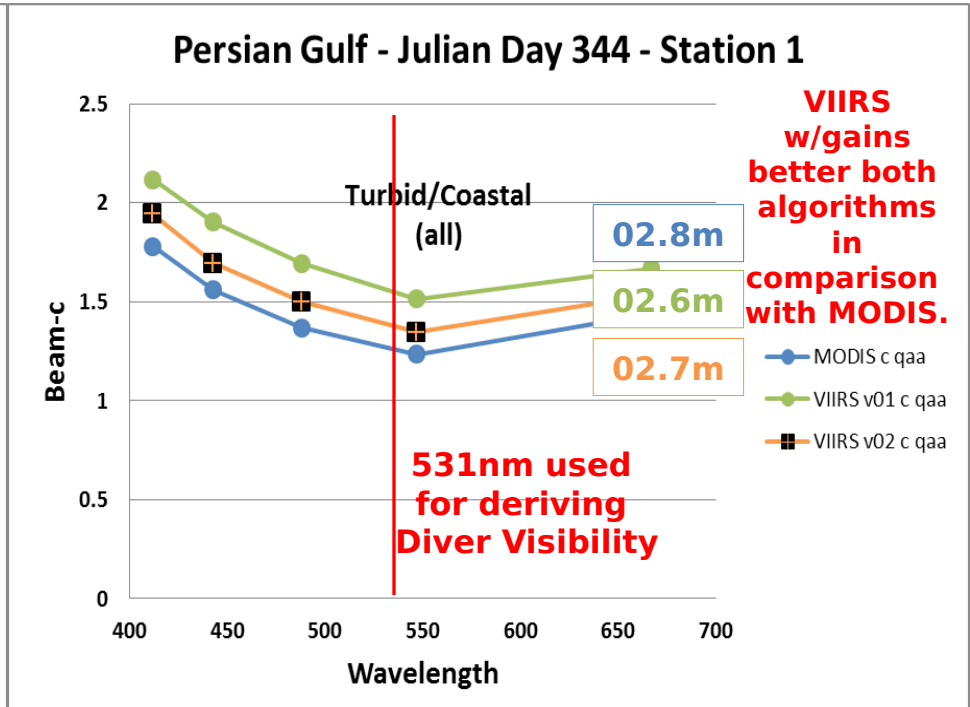
VIIRS(gains) vs, MODIS Rrs improvement in comparison to MODIS

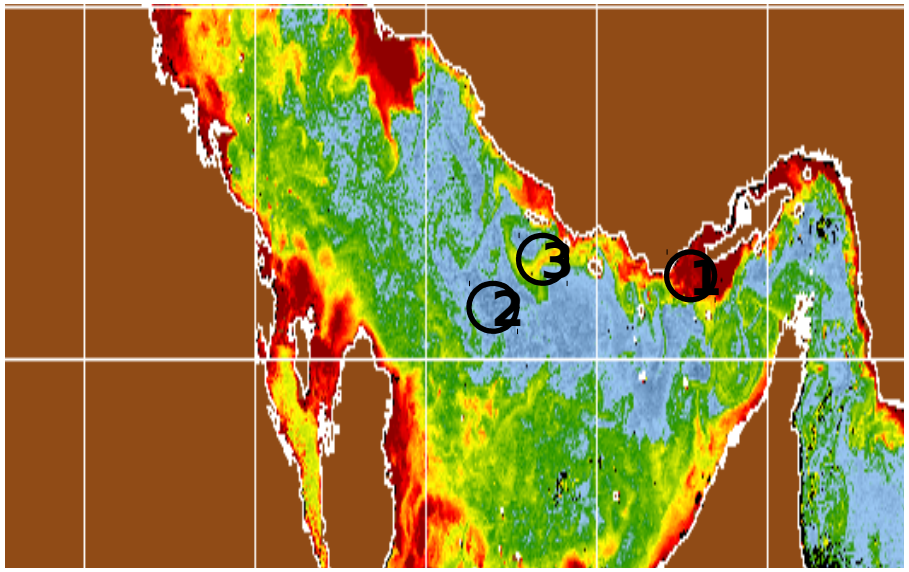


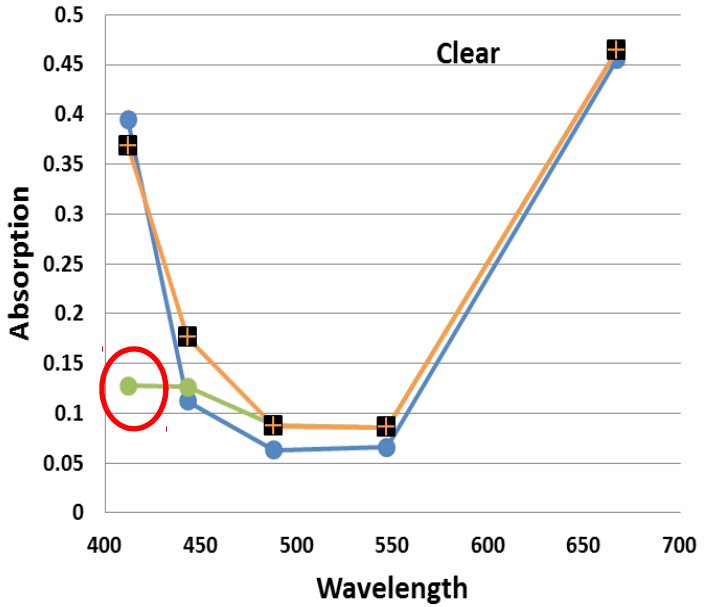

1
2
3

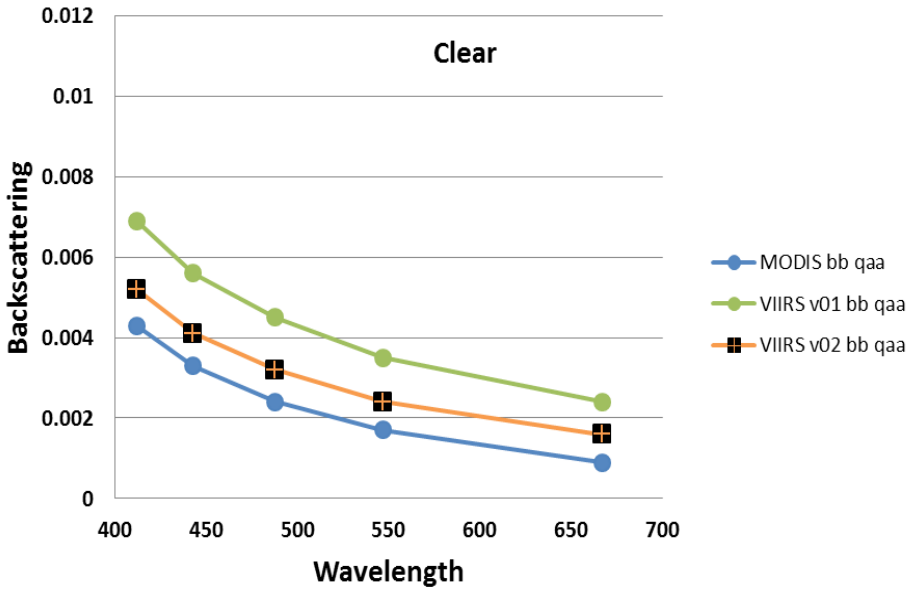

Persian Gulf - Julian Day 344 - Station 1
Turbid/Coastal
(all)
Absorption
Wavelength
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
400
450
500
550
600
650
700
MODIS a qaa
VIIRS v01 a qaa
VIIRS v02 a qaa

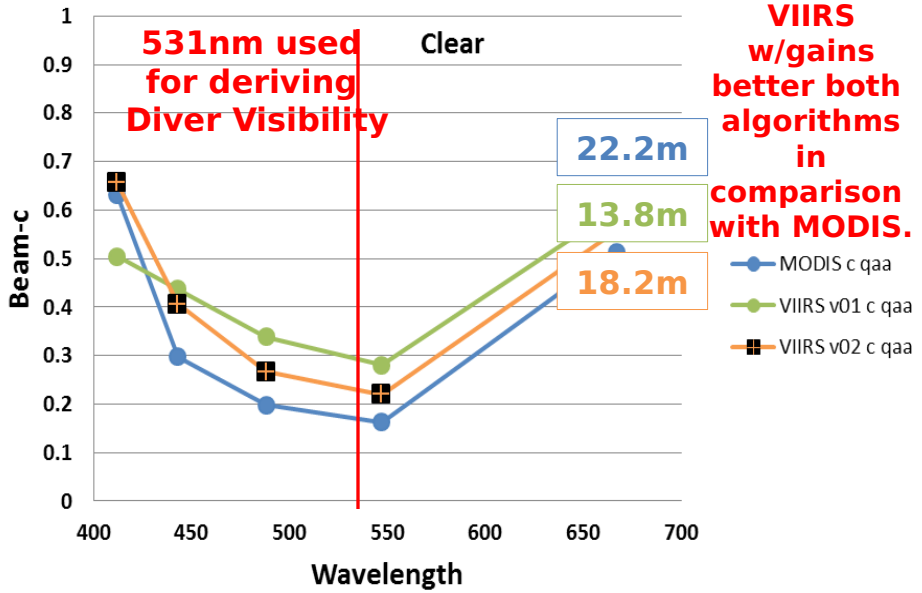

Persian Gulf - Julian Day 344 - Station 1
Turbid/Coastal
(all)
Backscattering
Wavelength
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
400
450
500
550
600
650
700
MODIS bb qaa
VIIRS v01 bb qaa
VIIRS v02 bb qaa

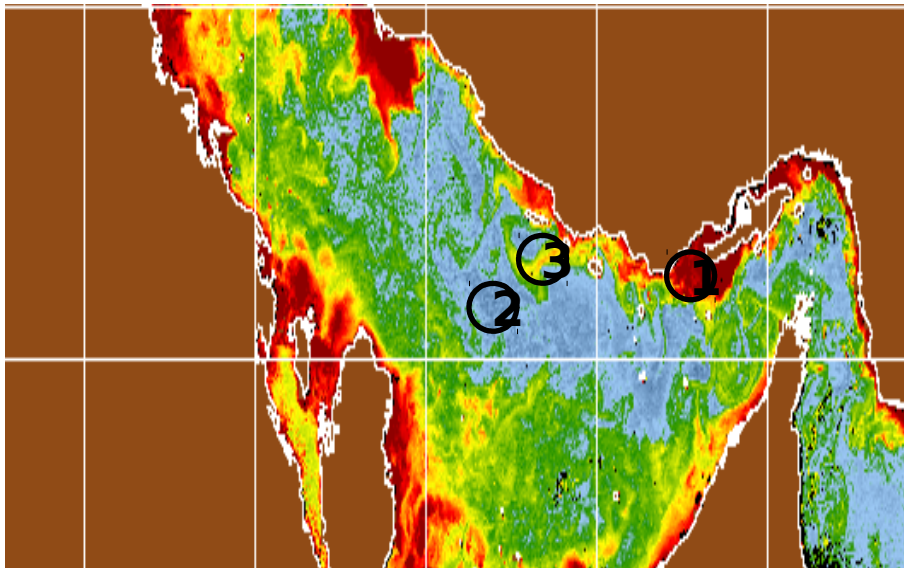

Persian Gulf - Julian Day 344 - Station 1
Turbid/Coastal
(all)
Beam-c
Wavelength
2.5
2
1.5
1
0.5
0
400
450
500
550
600
650
700
02.8m
02.6m
02.7m
MODIS c qaa
VIIRS v01 c qaa
VIIRS v02 c qaa
VIIRS w/gains better both algorithms in comparison with MODIS.
531nm used for deriving Diver Visibility

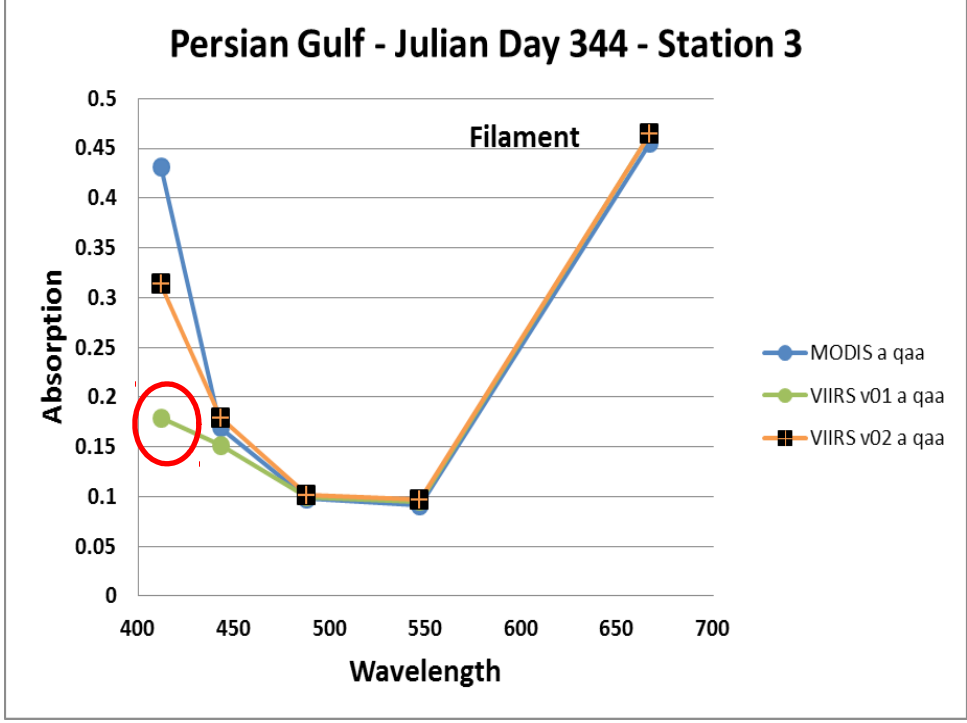

1
2
3

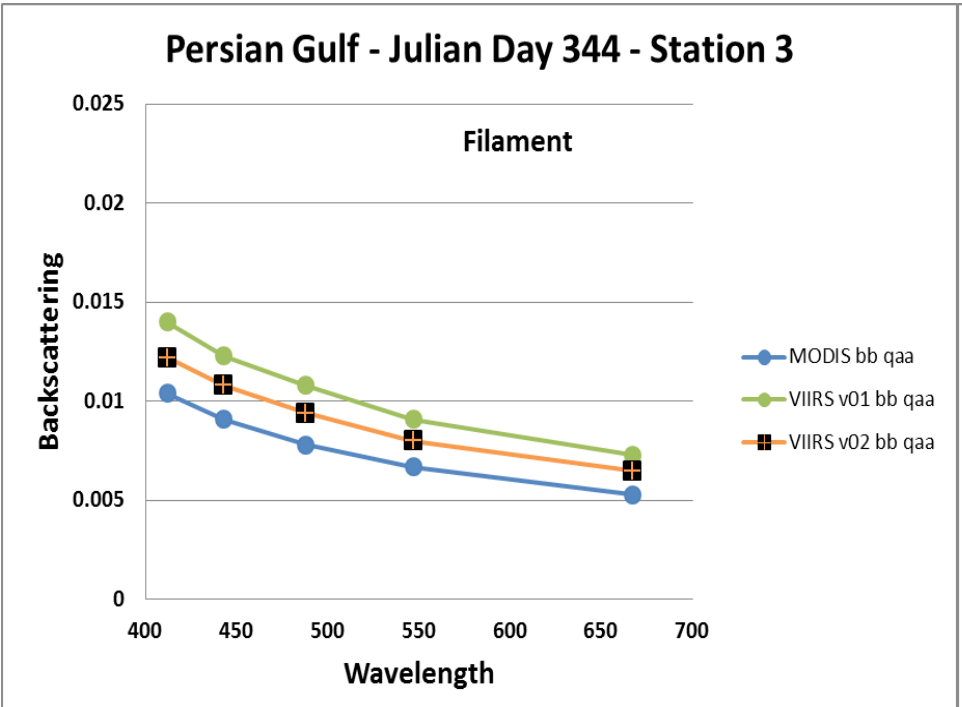

Persian Gulf - Julian Day 344 - Station 2
Clear
Absorption
Wavelength
MODIS a qaa
VIIRS v01 a qaa
VIIRS v02 a qaa

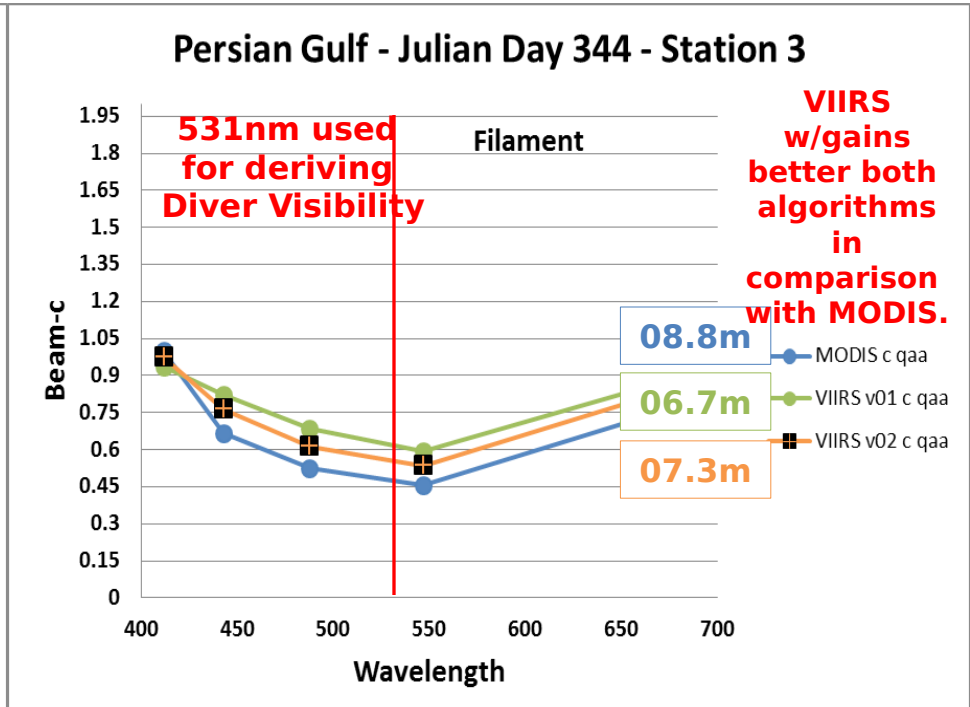

Persian Gulf - Julian Day 344 - Station 2
Clear
Backscattering
Wavelength
MODIS bb qaa
VIIRS v01 bb qaa
VIIRS v02 bb qaa


Persian Gulf - Julian Day 344 - Station 2
531nm used for deriving Diver Visibility
Clear
22.2m
13.8m
18.2m
VIIRS w/gains better both algorithms in comparison with MODIS.
Beam-c
Wavelength
MODIS c qaa
VIIRS v01 c qaa
VIIRS v02 c qaa


1
2
3

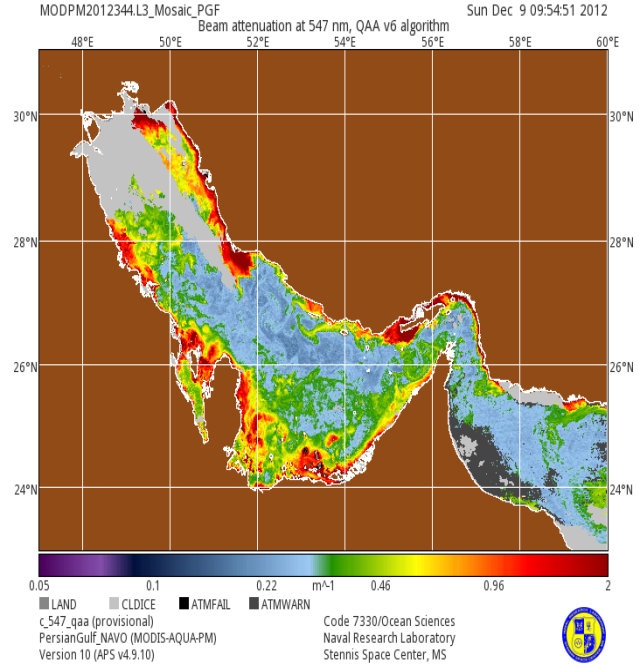

Persian Gulf - Julian Day 344 - Station 3
Filament
Absorption
Wavelength
0.5
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
400
450
500
550
600
650
700
MODIS a qaa
VIIRS v01 a qaa
VIIRS v02 a qaa

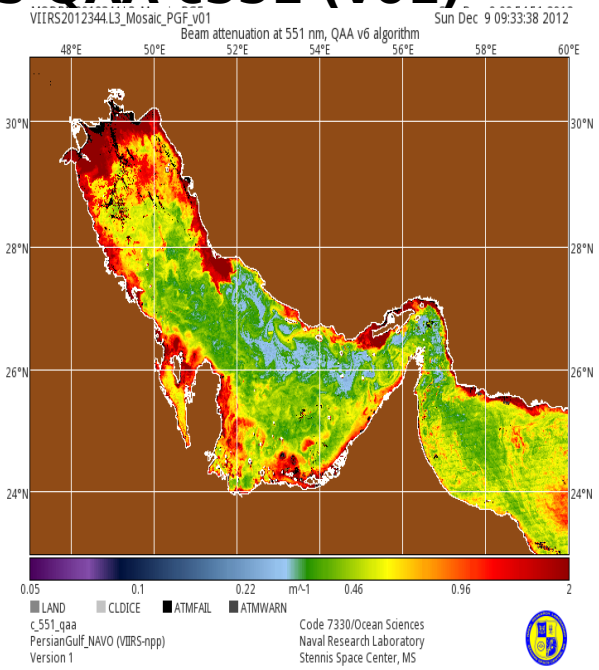

Persian Gulf - Julian Day 344 - Station 3
Filament
Backscattering
Wavelength
0.025
0.02
0.015
0.01
0.005
0
400
450
500
550
600
650
700
MODIS bb qaa
VIIRS v01 bb qaa
VIIRS v02 bb qaa

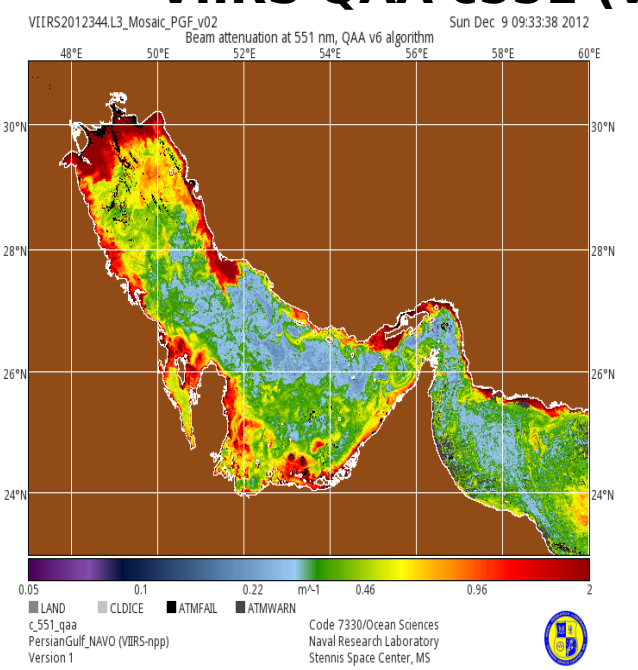

Persian Gulf - Julian Day 344 - Station 3
531nm used for deriving Diver Visibility
Filament
VIIRS w/gains better both algorithms in comparison with MODIS.
08.8m
06.7m
07.3m
Beam-c
Wavelength
1.95
1.8
1.65
1.5
1.35
1.2
1.05
0.9
0.75
0.6
0.45
0.3
0.15
0
400
450
500
550
600
650
700
MODIS c qaa
VIIRS v01 c qaa
VIIRS v02 c qaa

MODIS QAA c547VIIRS QAA c551 (v01)

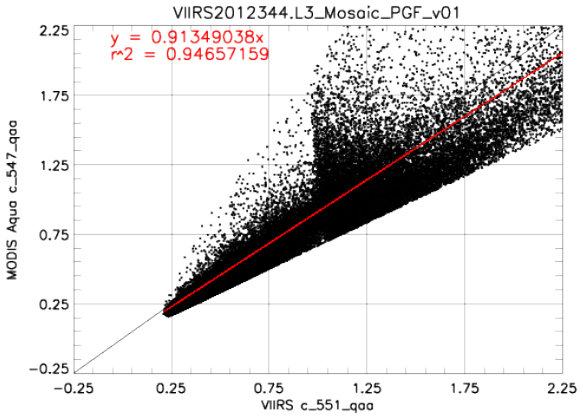
VIIRS QAA c551 (v

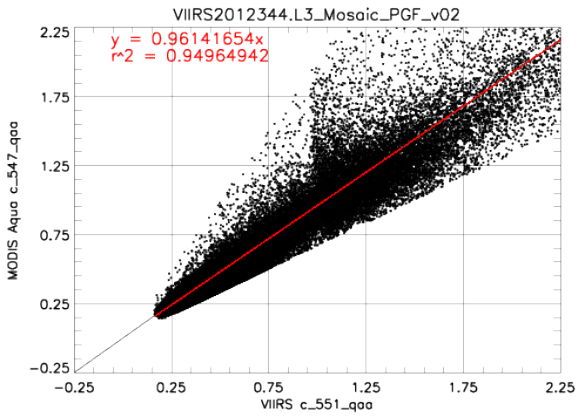




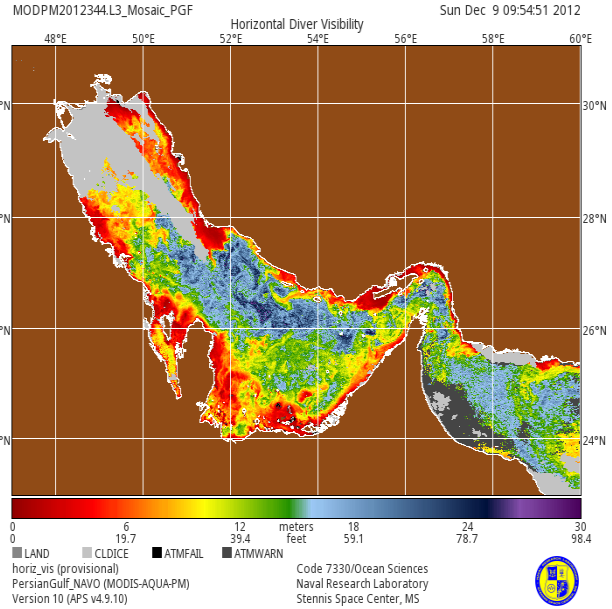


BEAM ATTENUATION

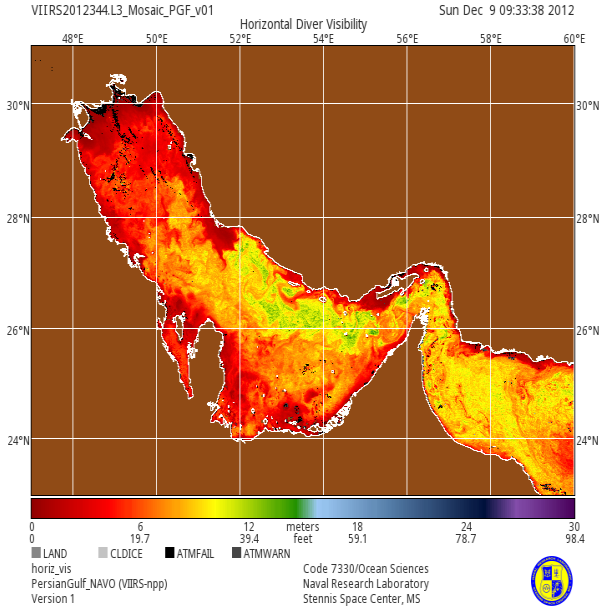




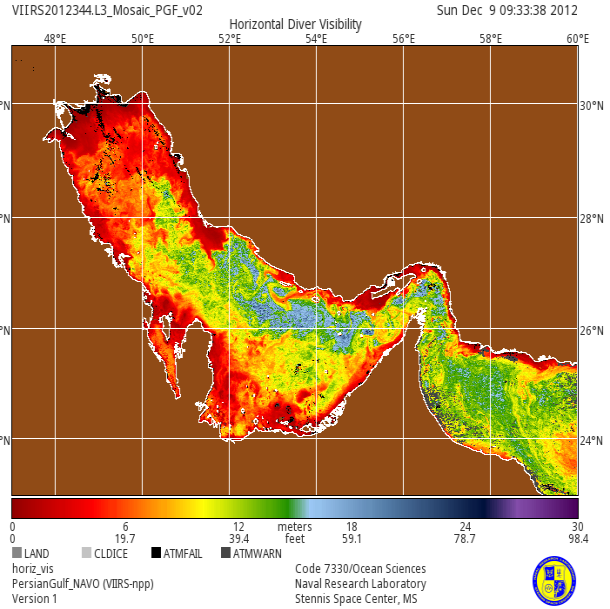
MODIS Horiz Visibility



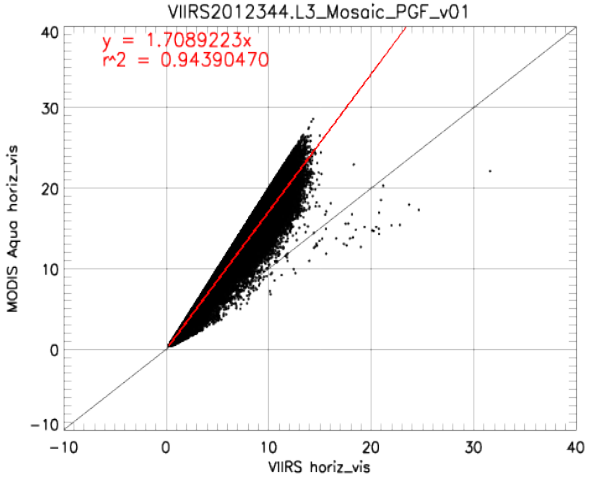
VIIRS Horiz Visibility (v01)

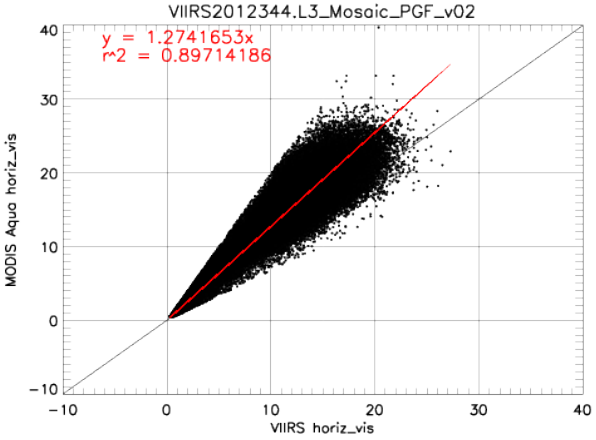


VIIRS Horiz Visibility



HORIZONTAL VISIBILITY

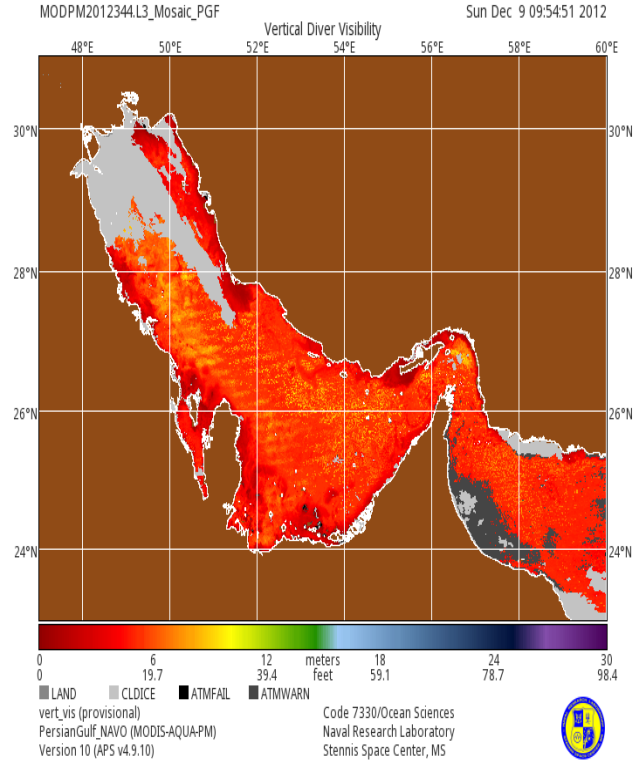


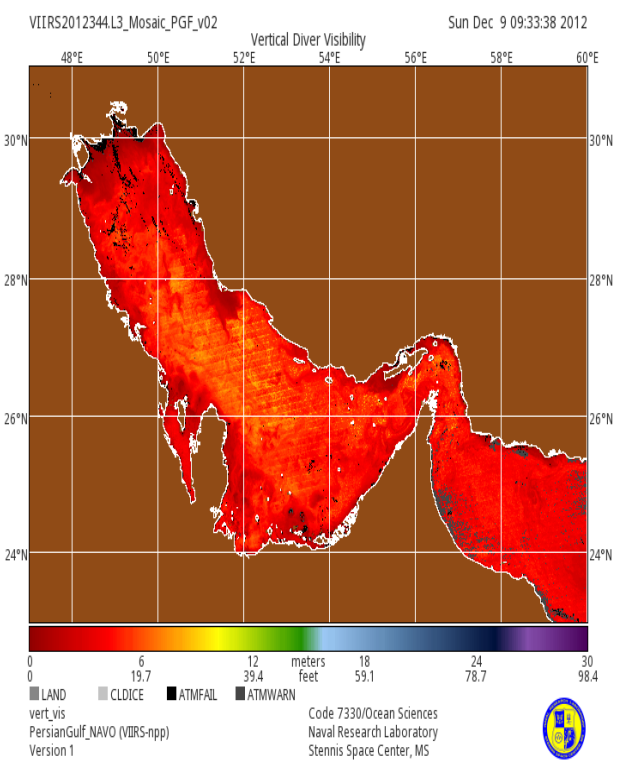


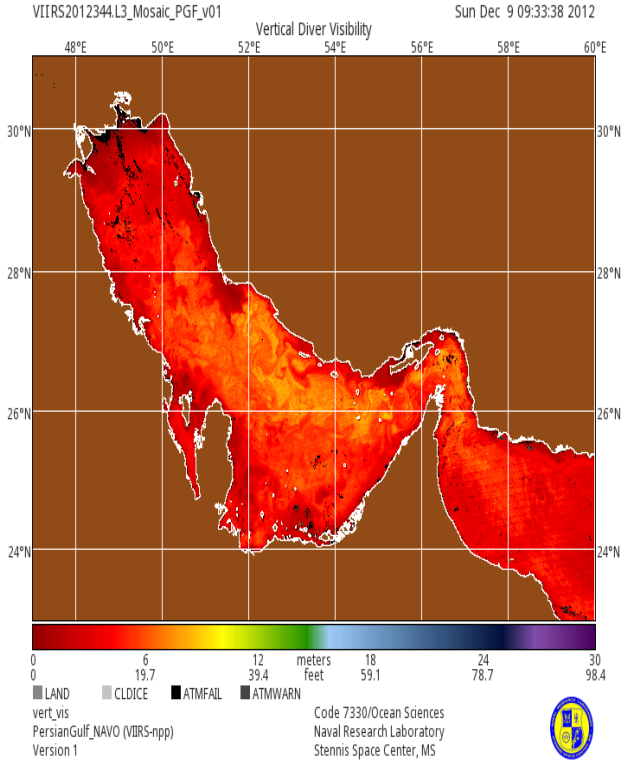
ODIS

VIIRS (v02)

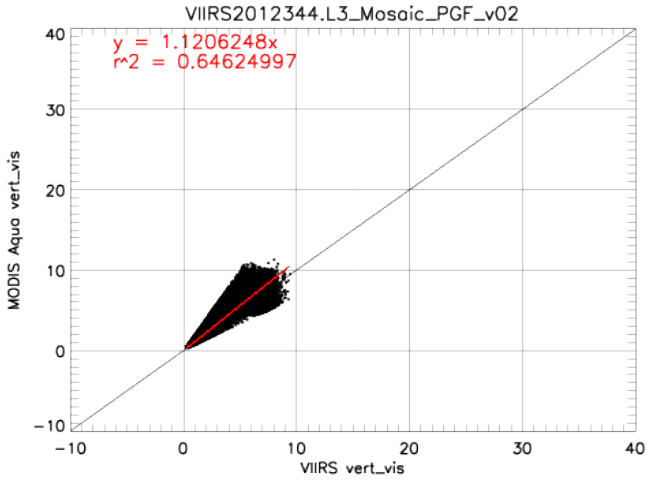
VIIRS

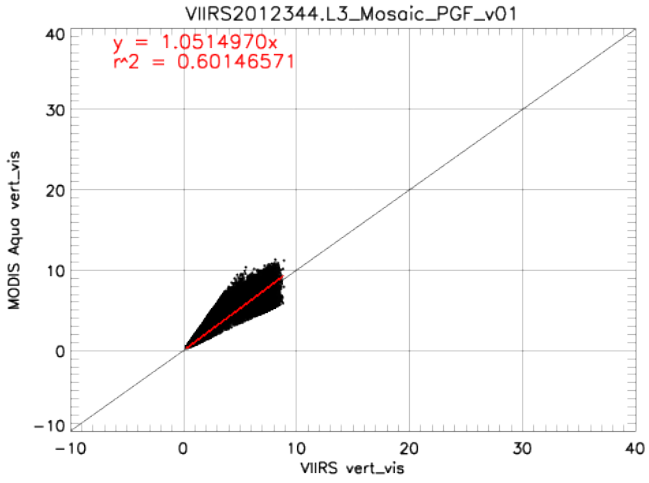


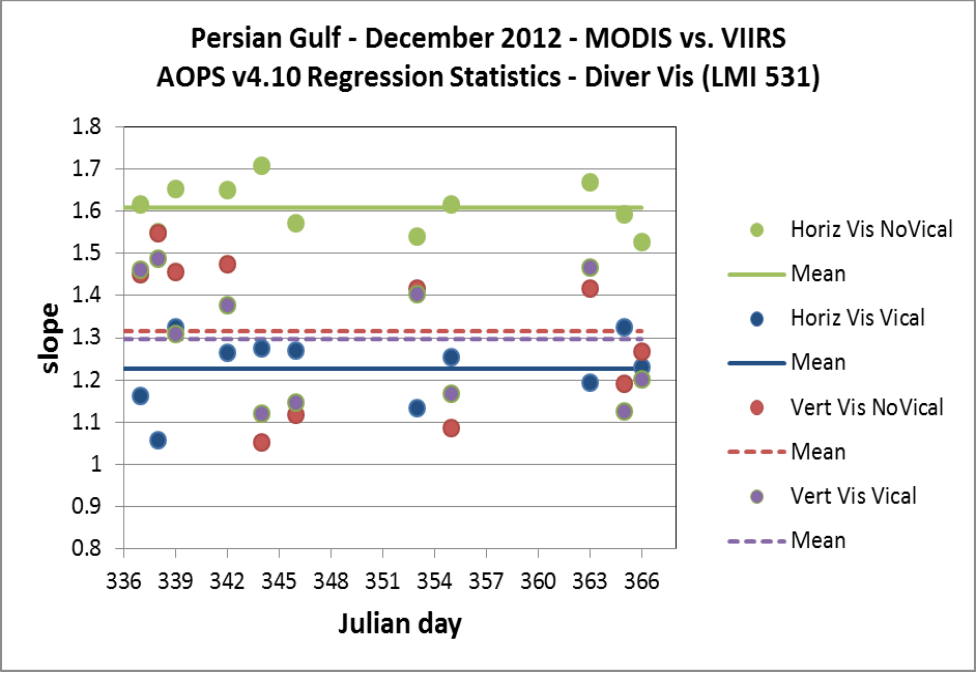


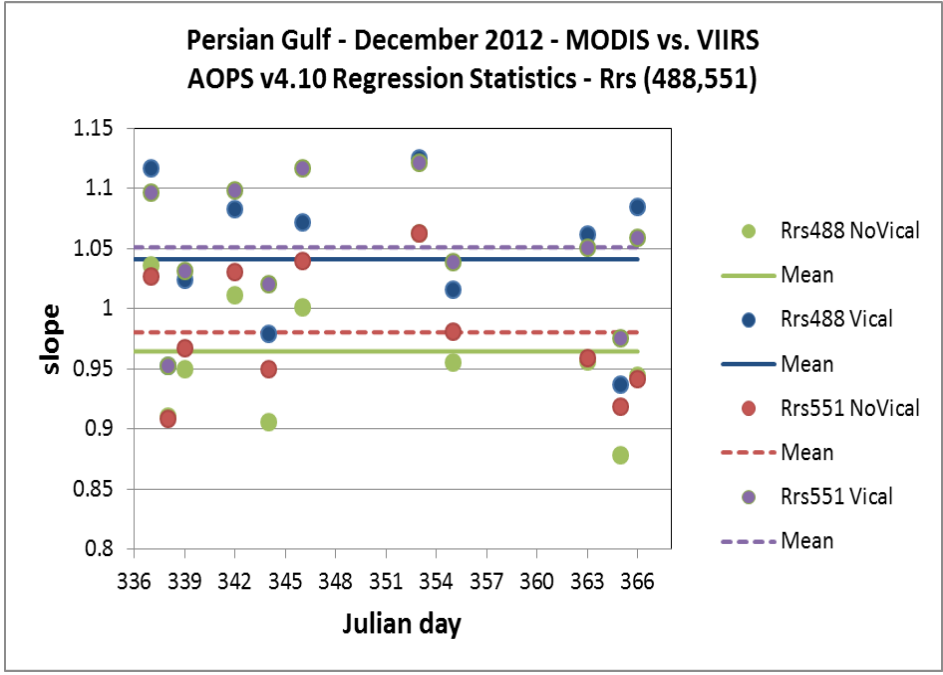


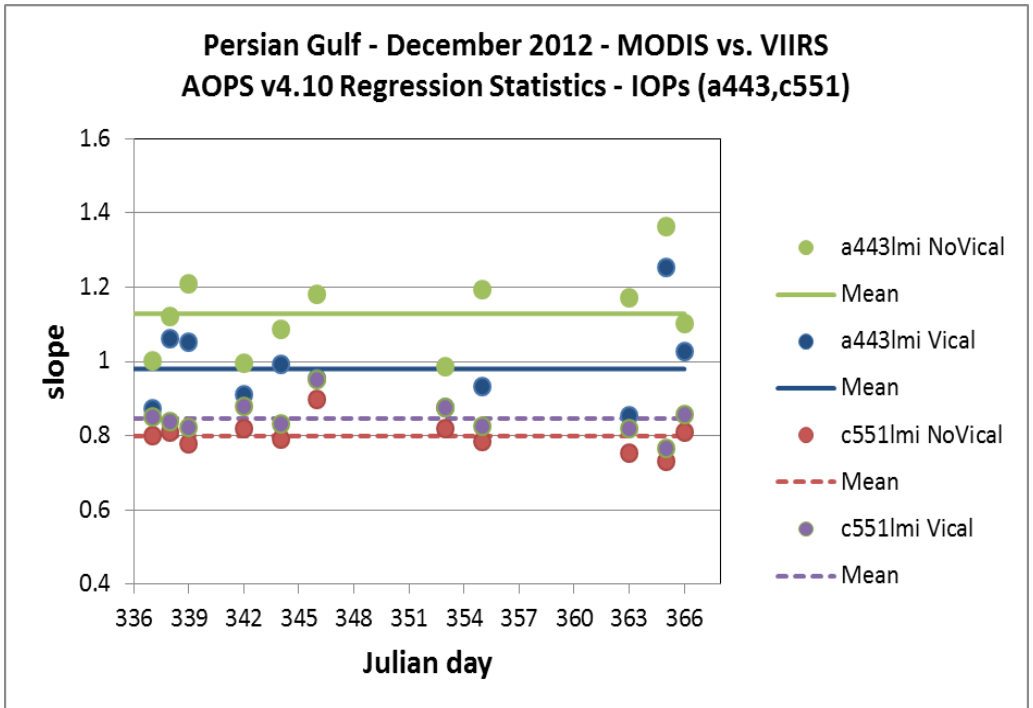
VERTICAL VISIBILITY



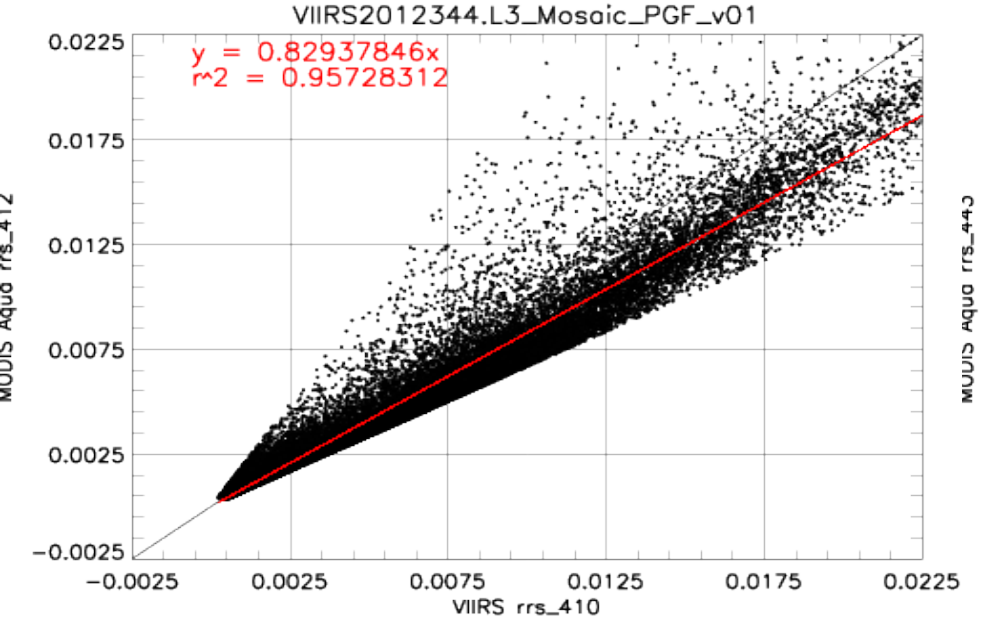


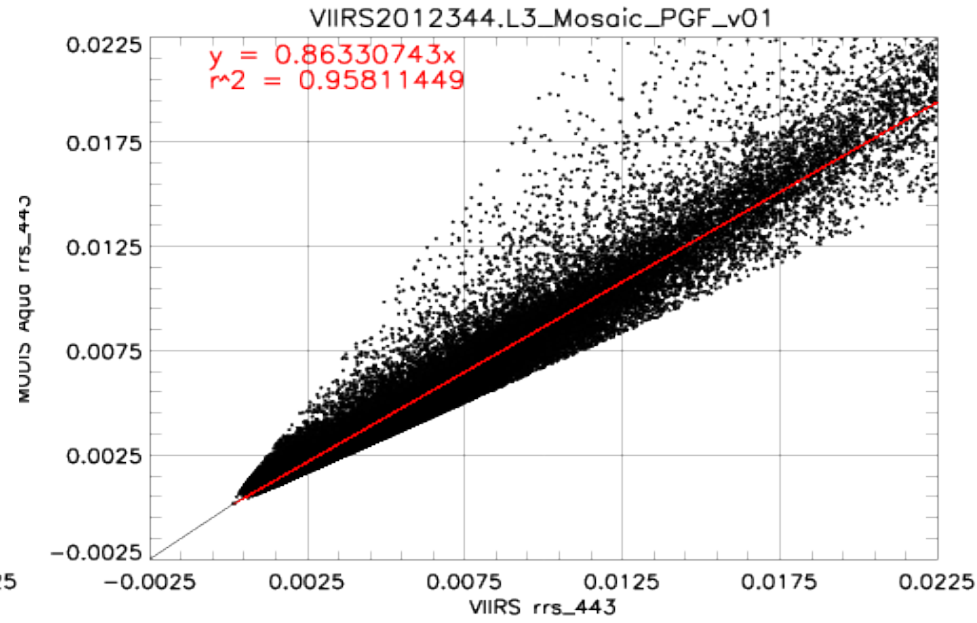

Persian Gulf - December 2012 - MODIS vs. VIIRS
AOPS v4.10 Regression Statistics - Diver Vis (LMI 531)
slope
Julian day
Horiz Vis NoVical
Mean
Horiz Vis Vical
Mean
Vert Vis NoVical
Mean
Vert Vis Vical
Mean

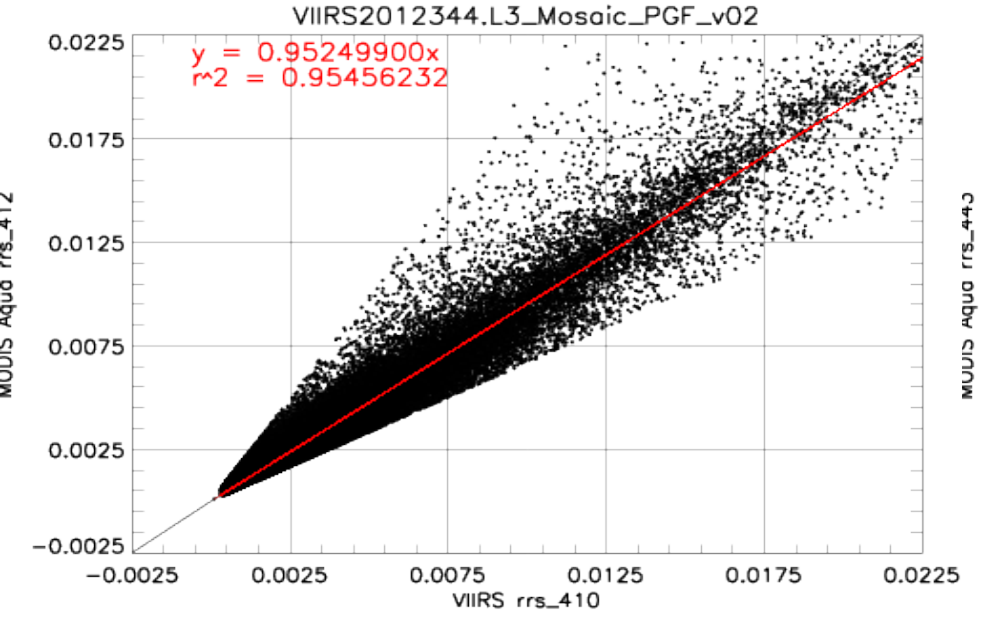

Persian Gulf - December 2012 - MODIS vs. VIIRS
AOPS v4.10 Regression Statistics - Rrs (488,551)
slope
Julian day
Rrs488 NoVical
Mean
Rrs488 Vical
Mean
Rrs551 NoVical
Mean
Rrs551 Vical
Mean

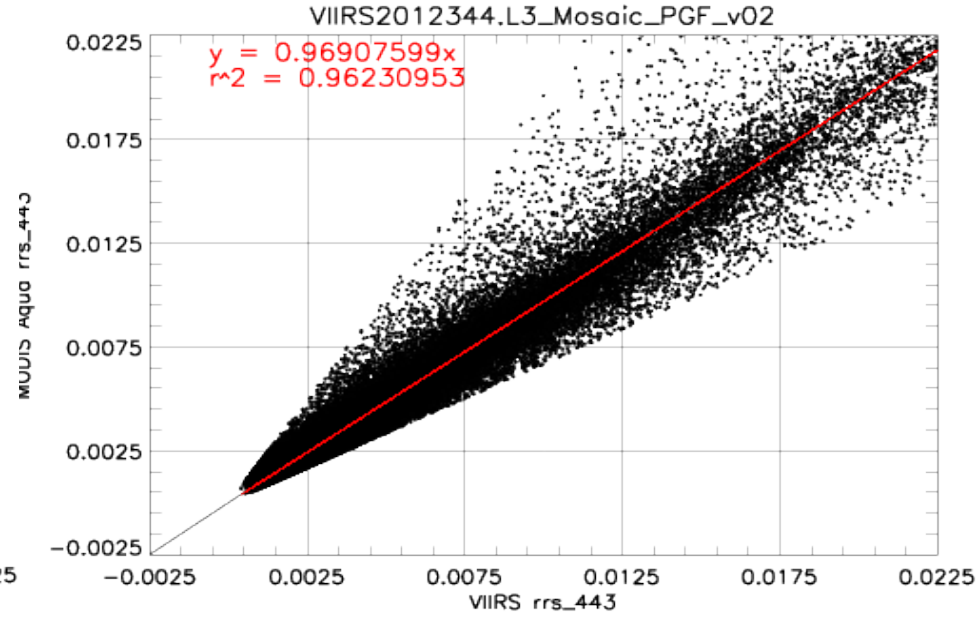

Persian Gulf - December 2012 - MODIS vs. VIIRS
AOPS v4.10 Regression Statistics - IOPs (a443,c551)
slope
Julian day
a443lmi NoVical
Mean
a443lmi Vical
Mean
c551lmi NoVical
Mean
c551lmi Vical
Mean

Rrs Matchup MODIS vs. VIIRS (412,443)

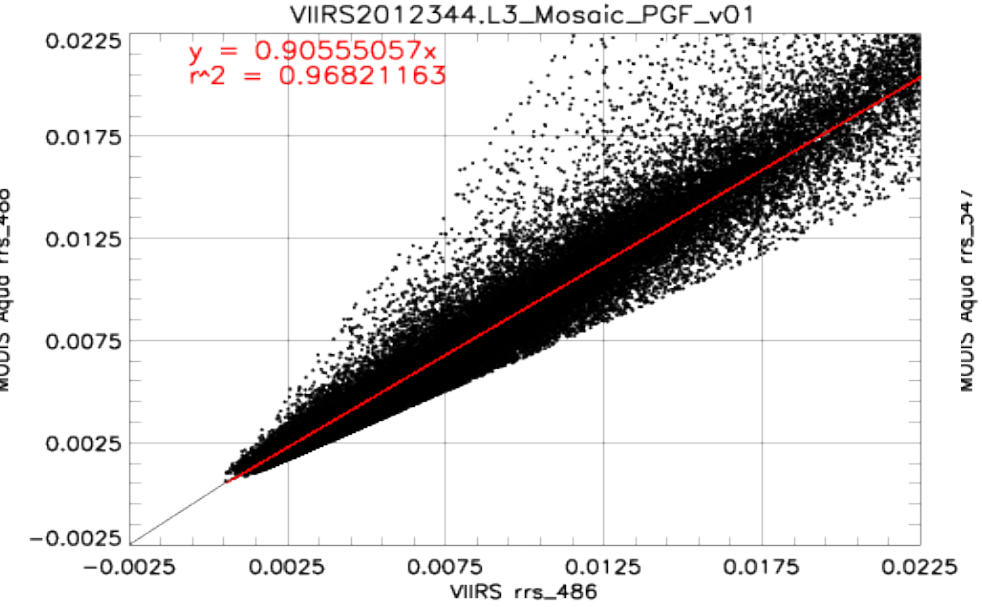


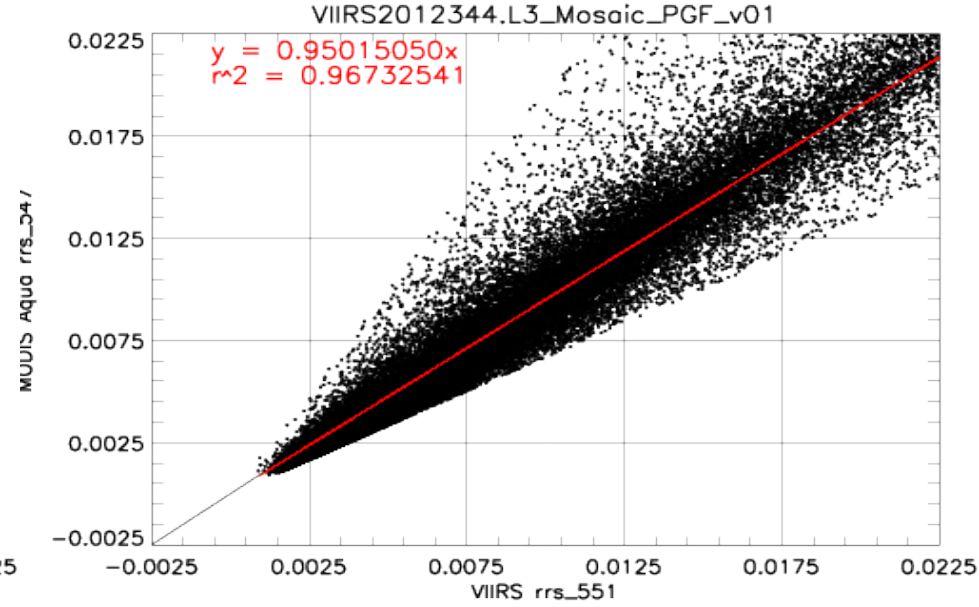


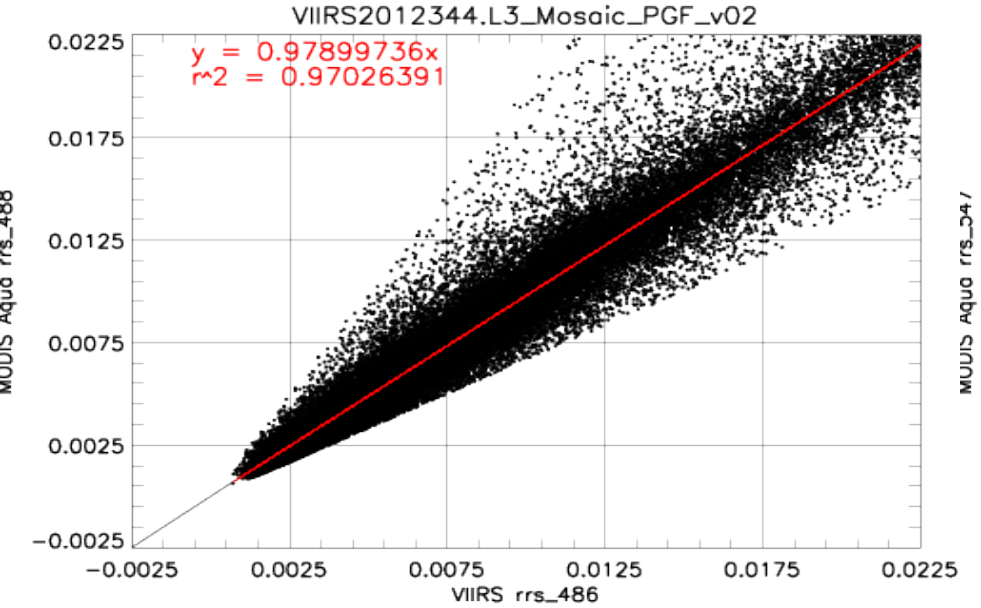


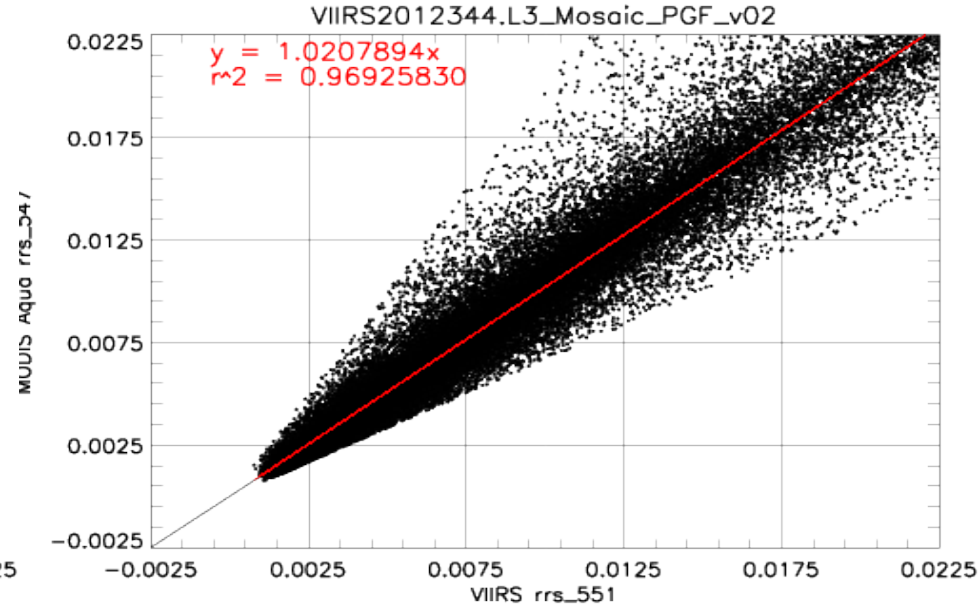


Rrs Matchup MODIS vs. VIIRS (488,451)

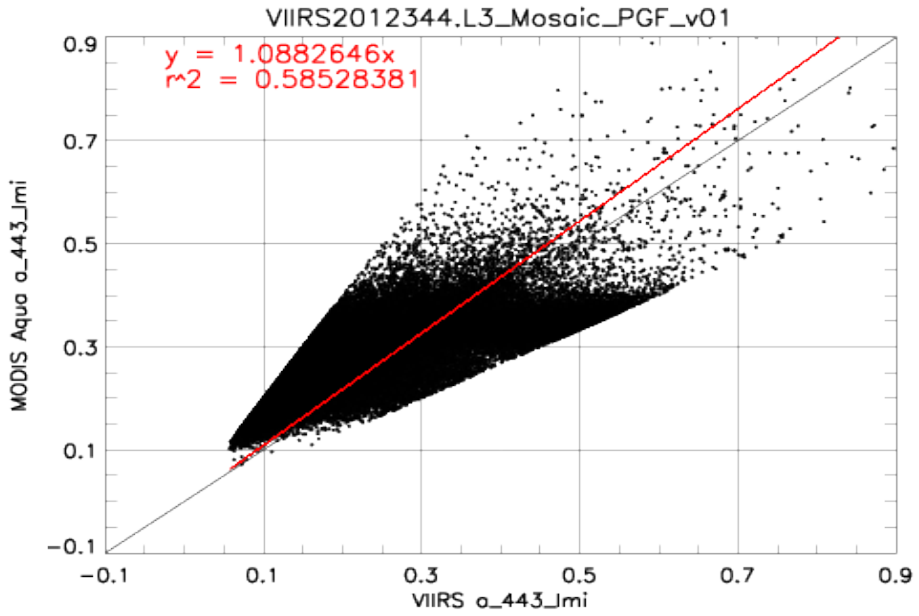


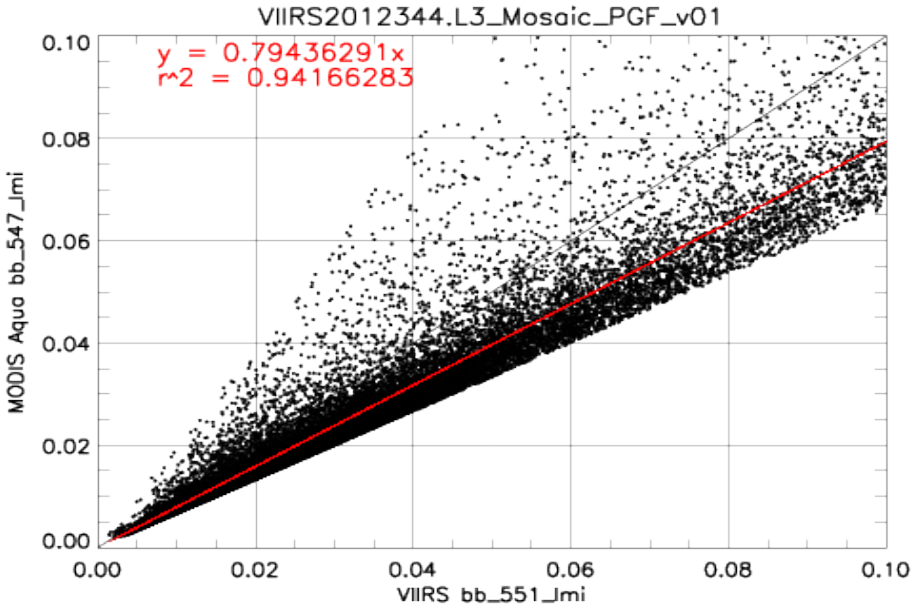


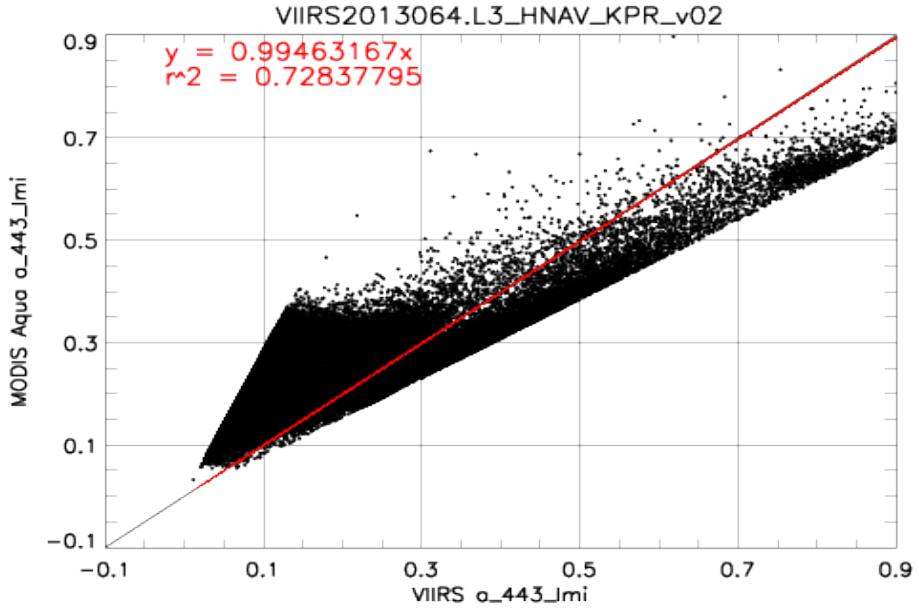


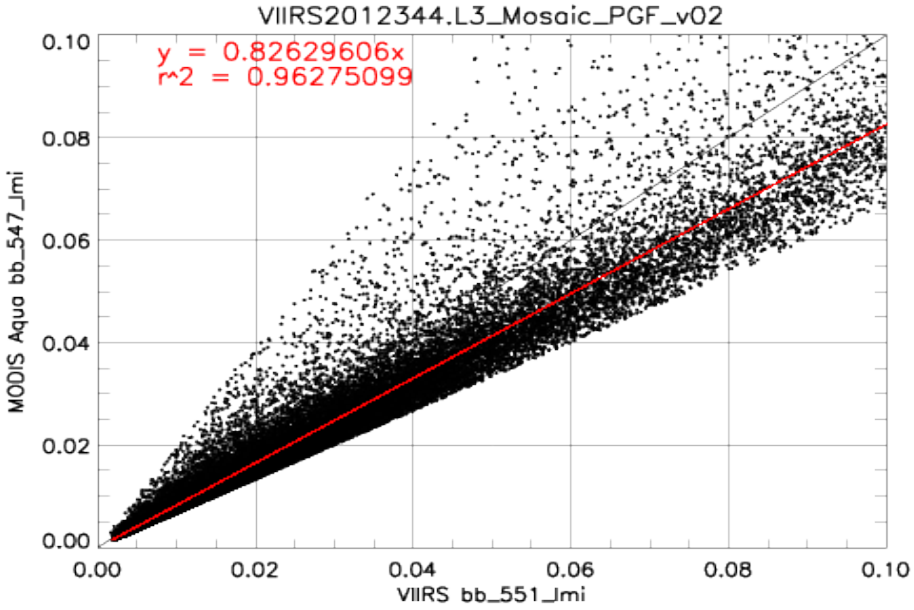


a,bb Matchup MODIS vs. VIIRS

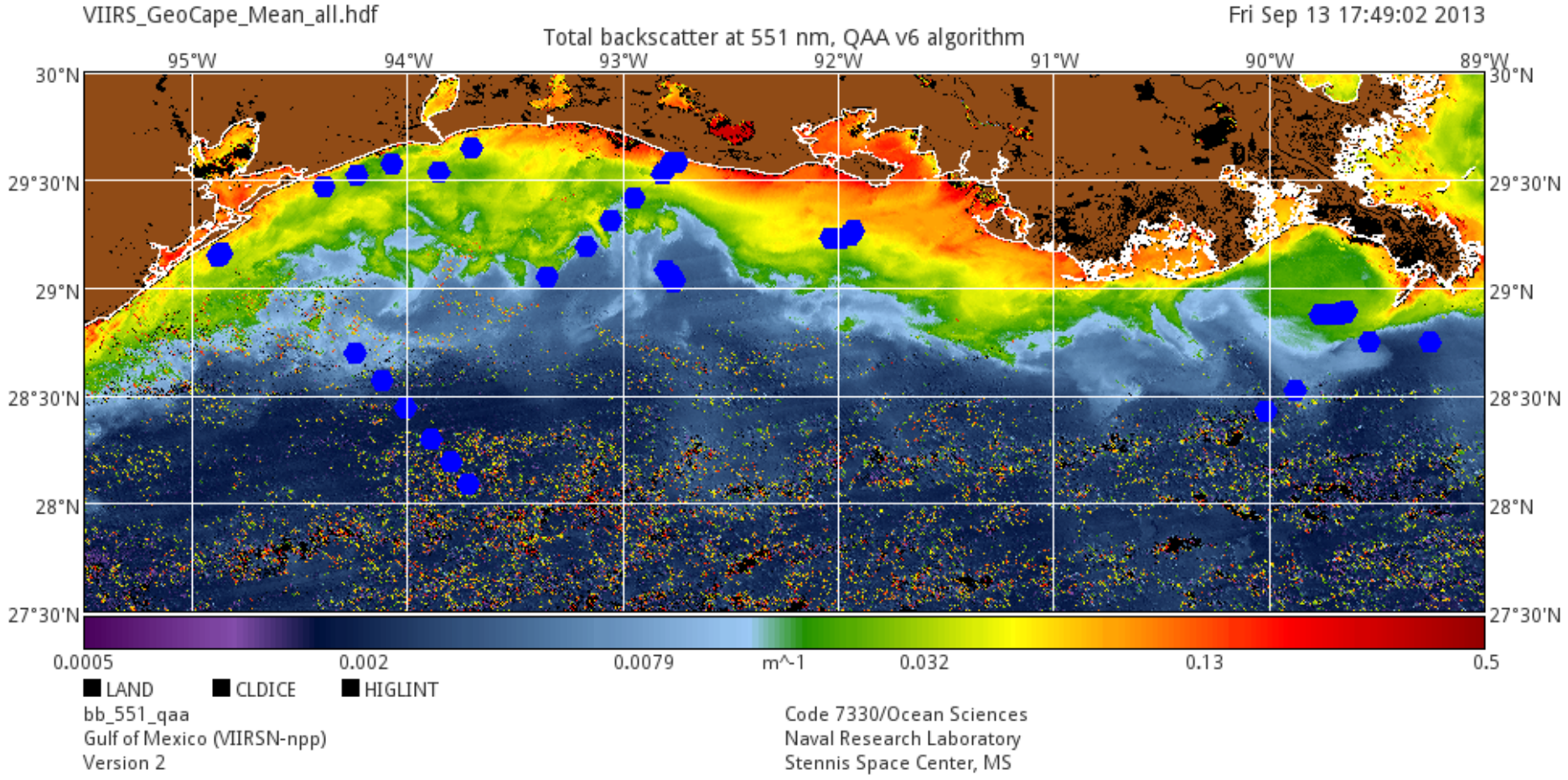






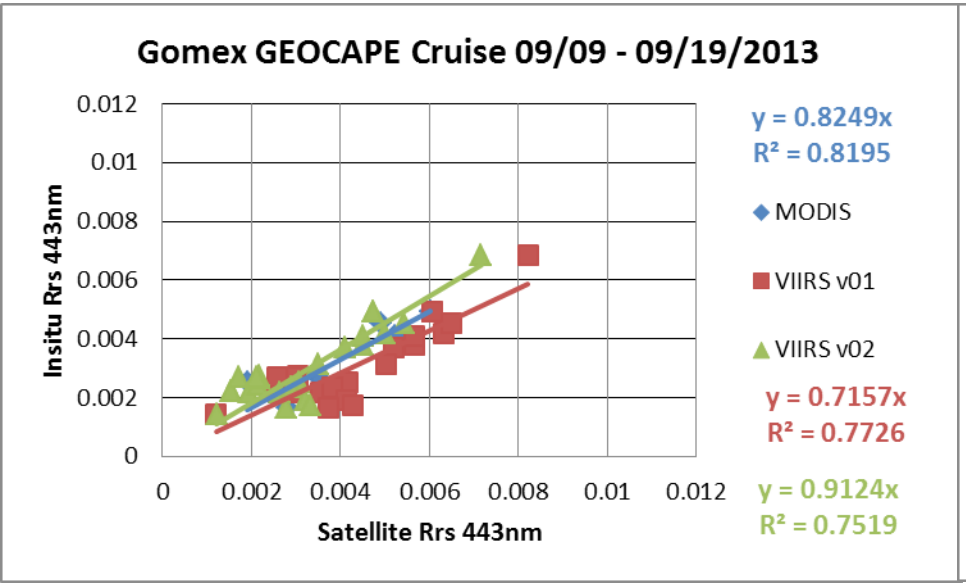


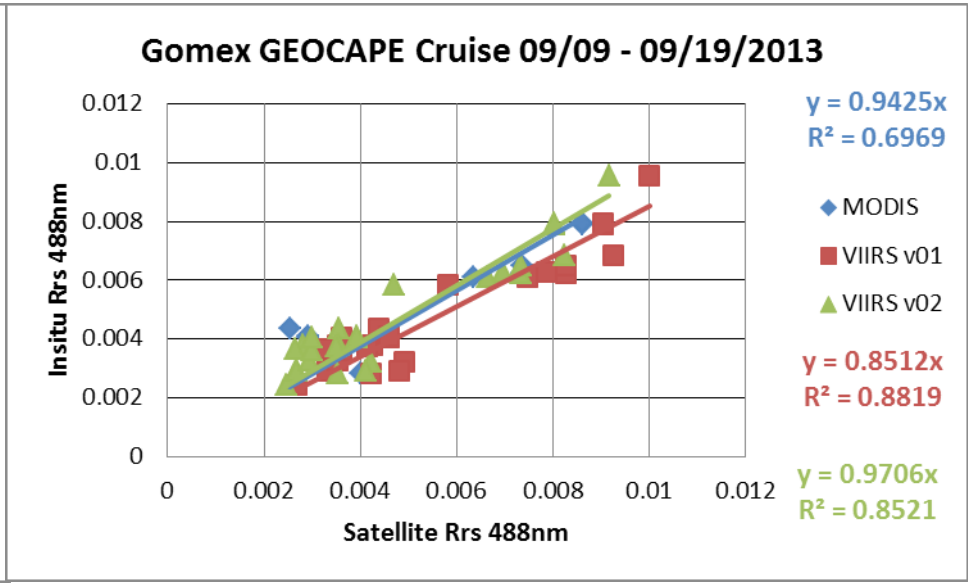
GEOCAPE / Northern Gulf of Mexico Cruise July 9-19, 2013
Rrs and IOP Station Locations

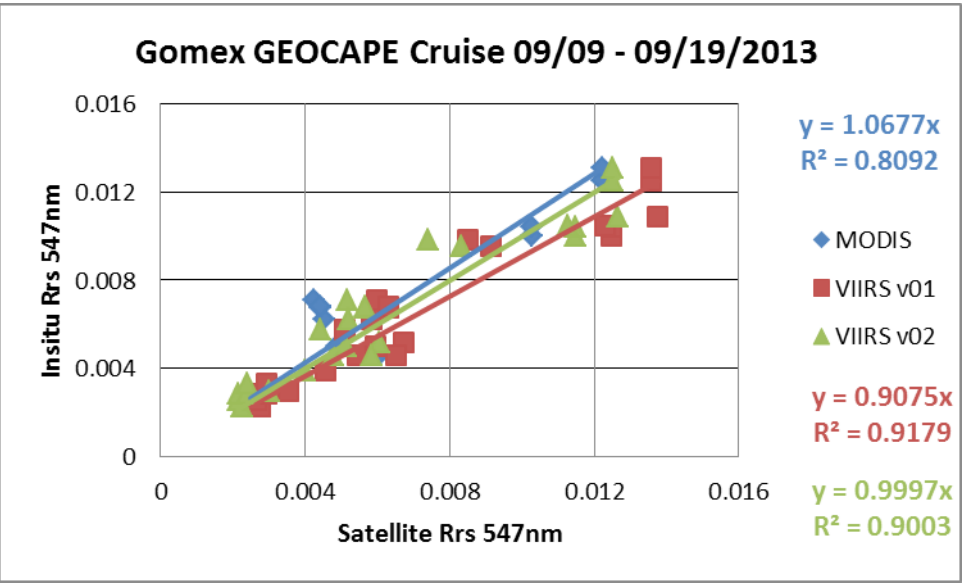


Insitu: UMASS/NOAA

GEOCAPE / Northern Gulf of Mexico Cruise July 9-19, 2013 - Scat







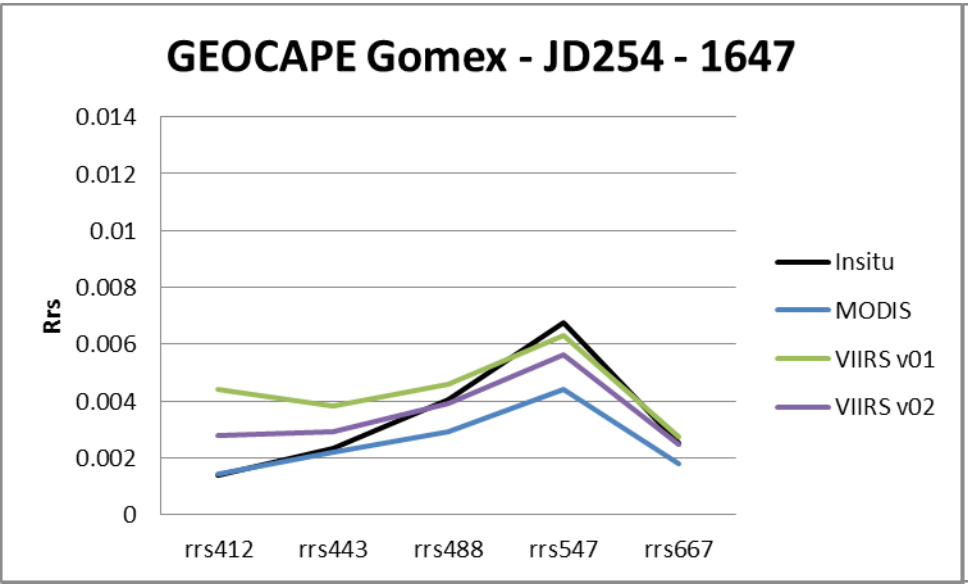
Slope	rrs412	rrs443	rrs488	rrs547
MODIS	0.85	0.82	0.94	1.07
VIIRS v01	0.5	0.72	0.85	0.91
VIIRS v02	0.79	0.91	0.97	0.99

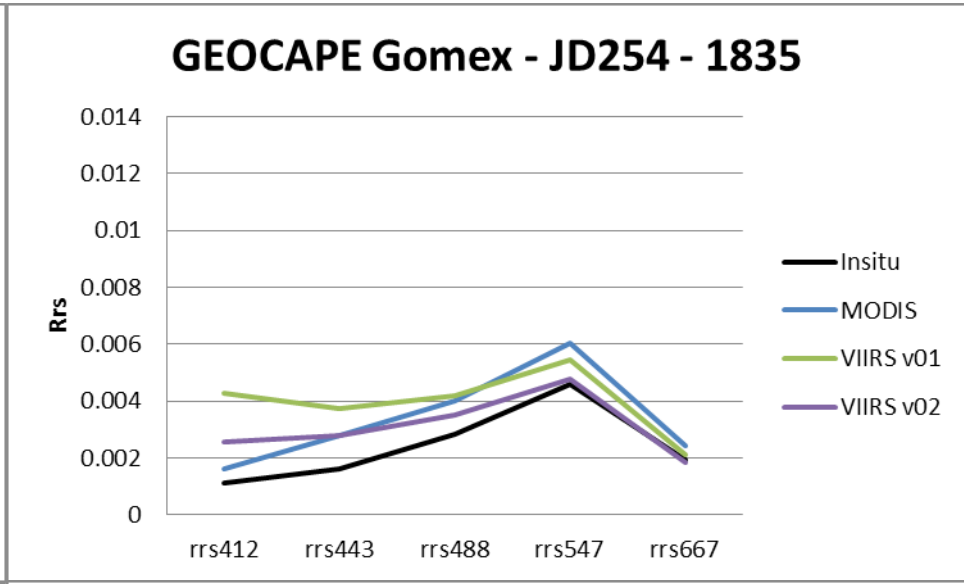
Rsquared	rrs412	rrs443	rrs488	rrs547
MODIS	0.91	0.86	0.85	0.86
VIIRS v01	0.44	0.77	0.89	0.92
VIIRS v02	0.40	0.78	0.88	0.92

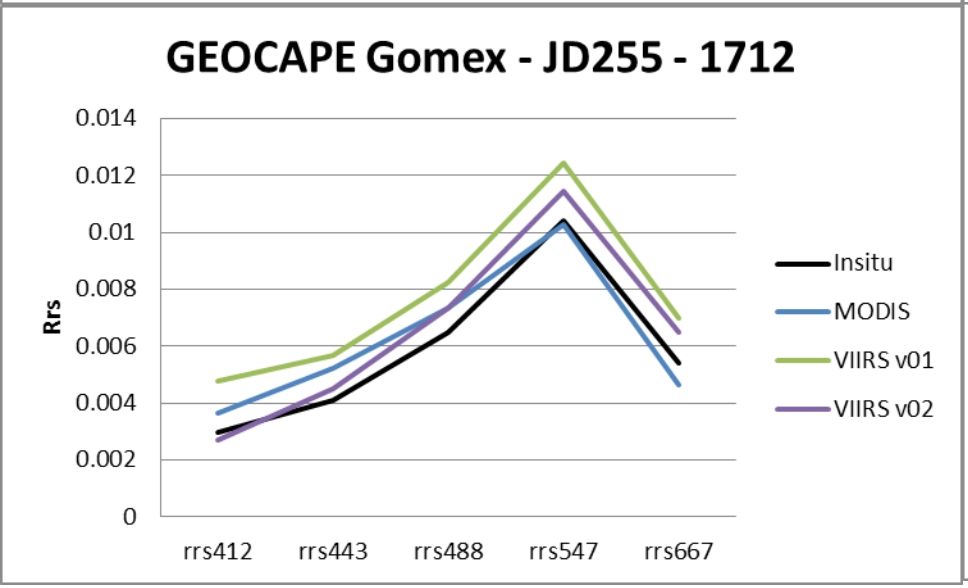
Insitu: UMASS/NOAA

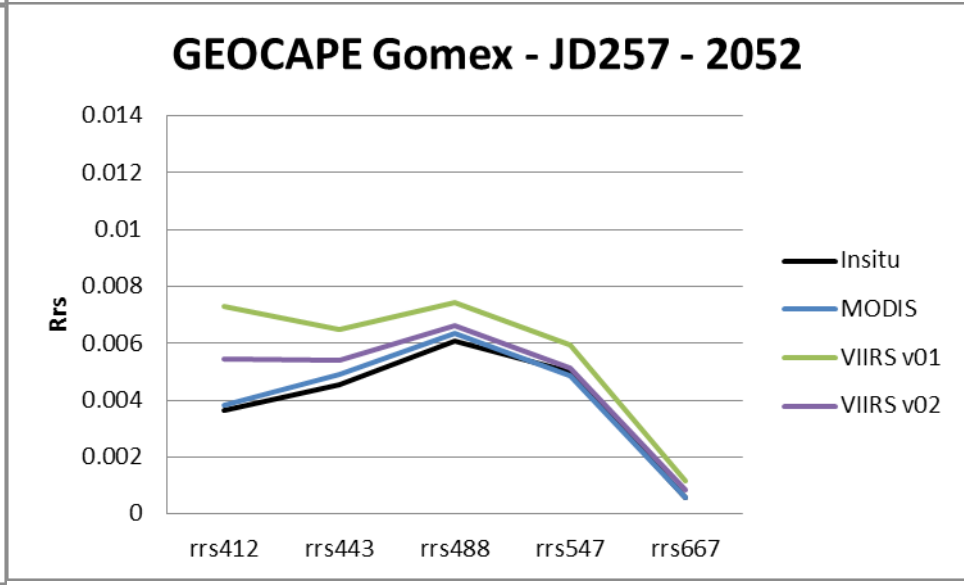
Both VIIRS and MODIS 412 a little off

EOCAPE / Northern Gulf of Mexico Cruise July 9-19, 2013 - Spectr



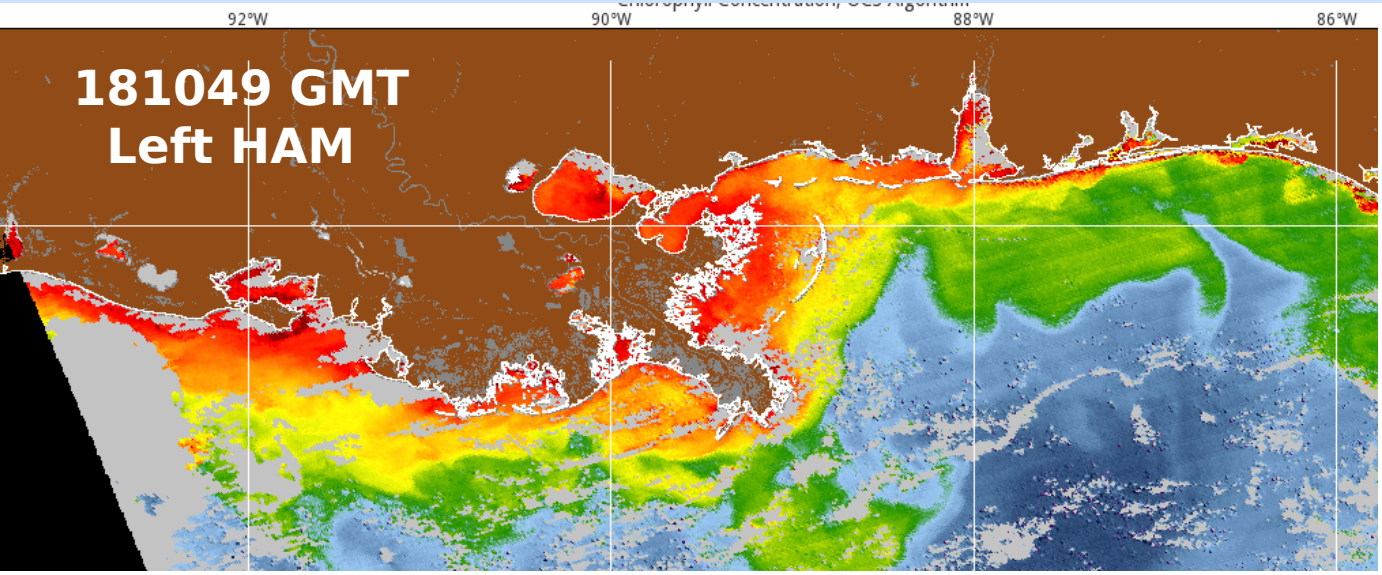


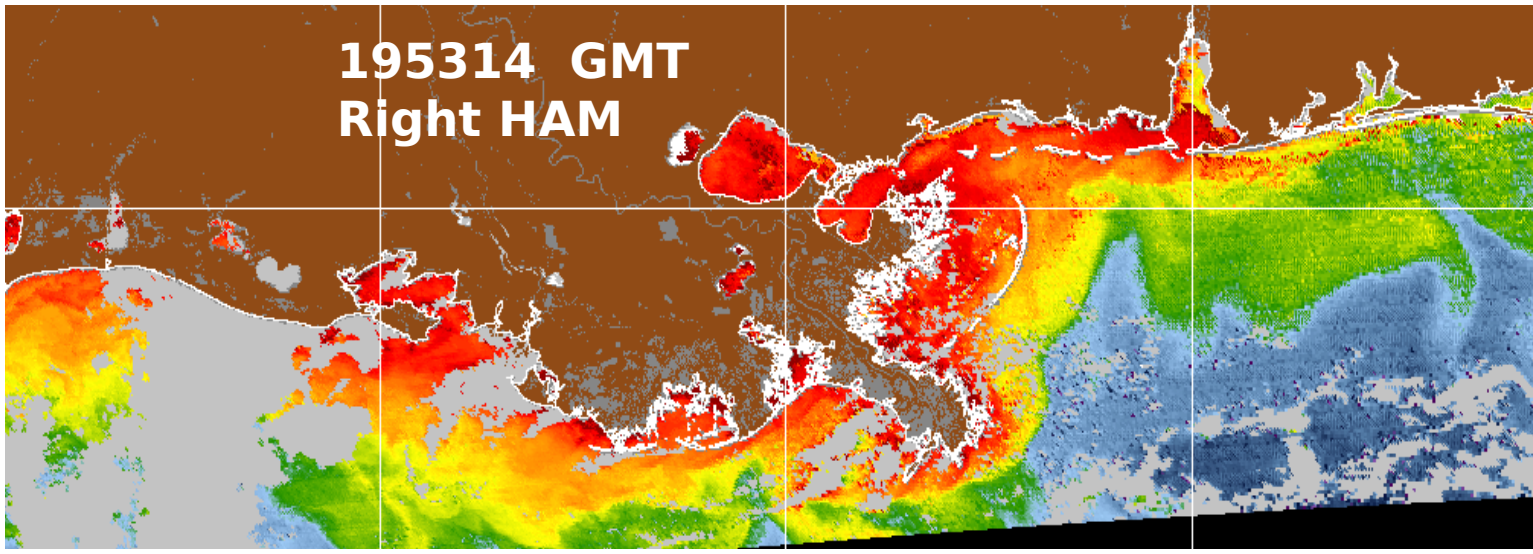




Insitu: UMASS/NOAA

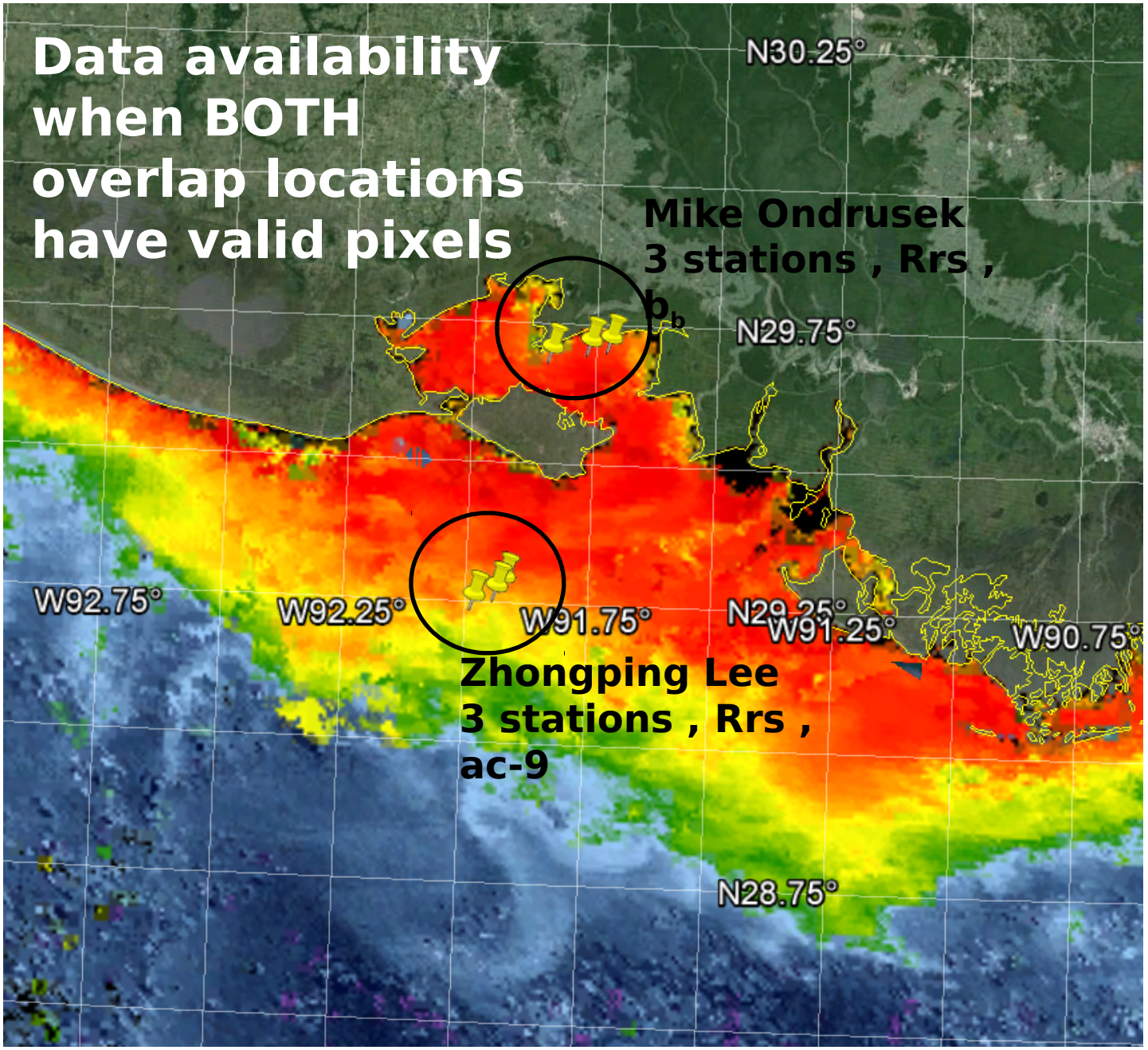
Validation and Ocean Color Uncertainty
Sept 12 , 2013 - NPP –VIIRS Orbital Overlap

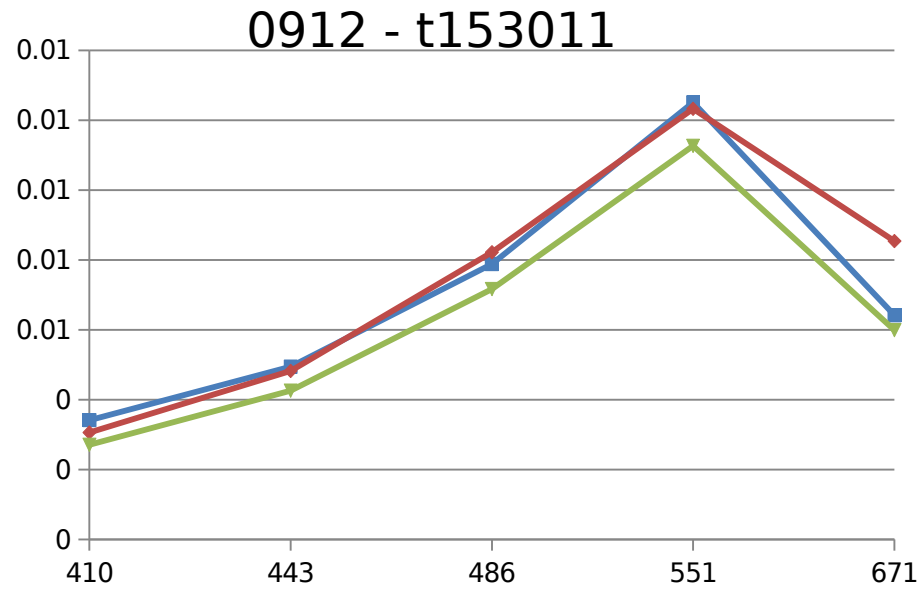




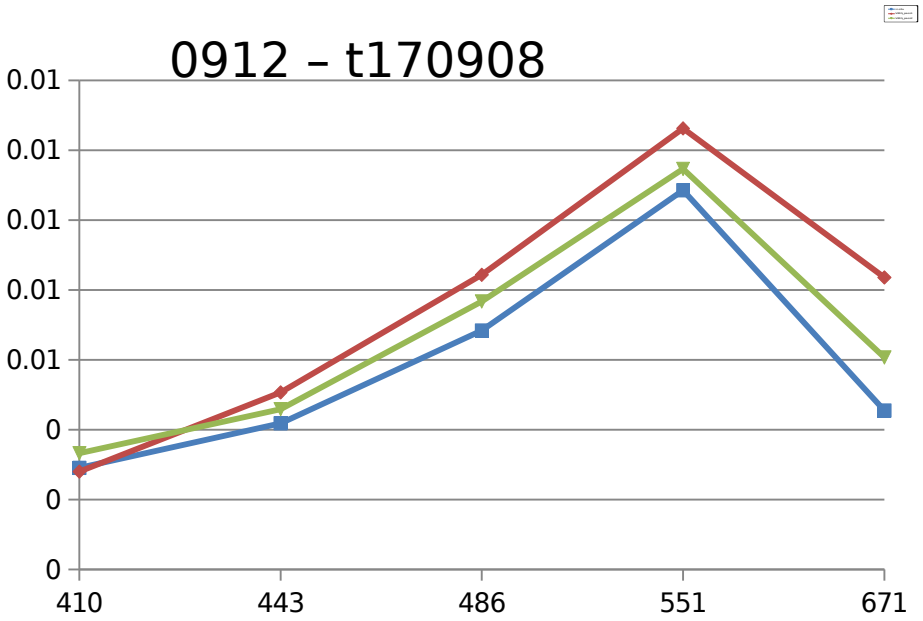
00 Minutes separation between orbital overlap – left and right side of s

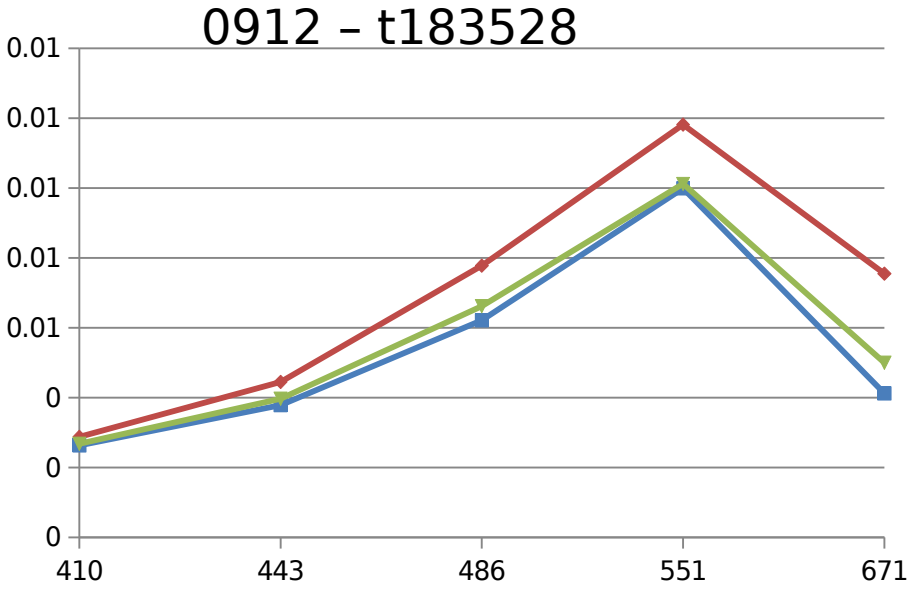
What is the product uncertainty between these NPP products?

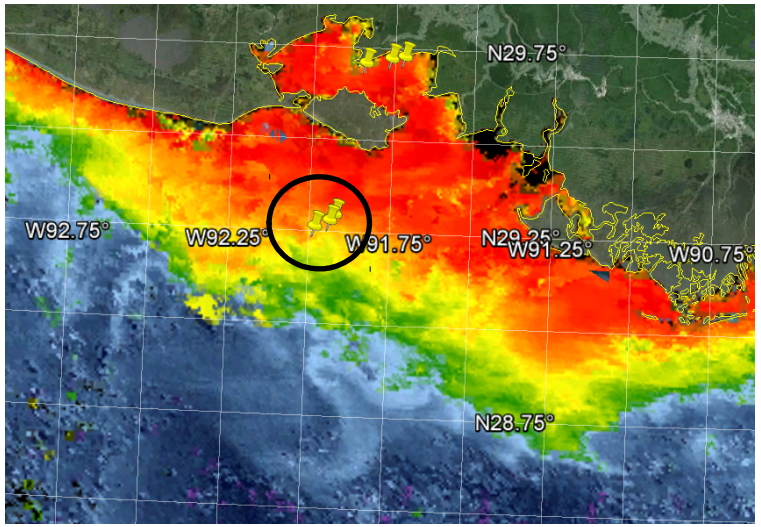

Data availability when BOTH overlap locations have valid pixels
Mike Ondrusek 3 stations , Rrs , b_b
Zhongping Lee 3 stations , Rrs , ac-9
N30.25°
N29.75°
N29.25°
N28.75°
W92.75°
W92.25°
W91.75°
W91.25°
W90.75°

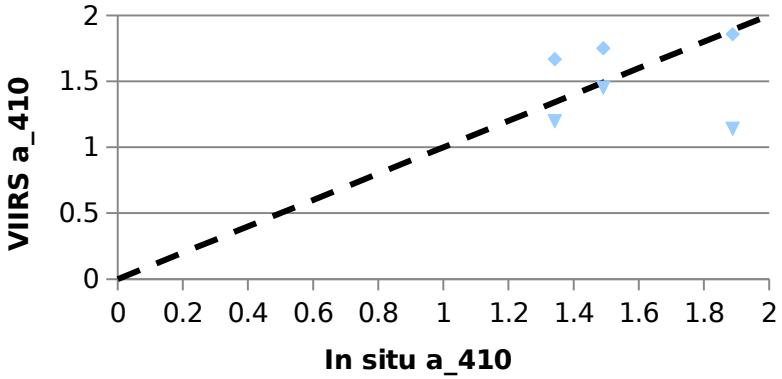


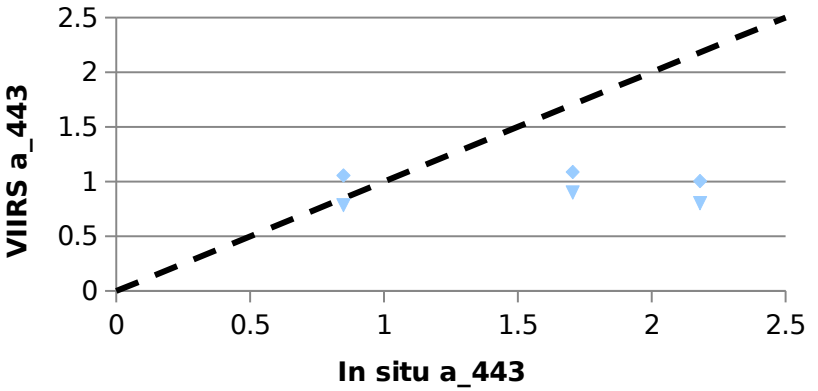
Zhongping Lee, rrs

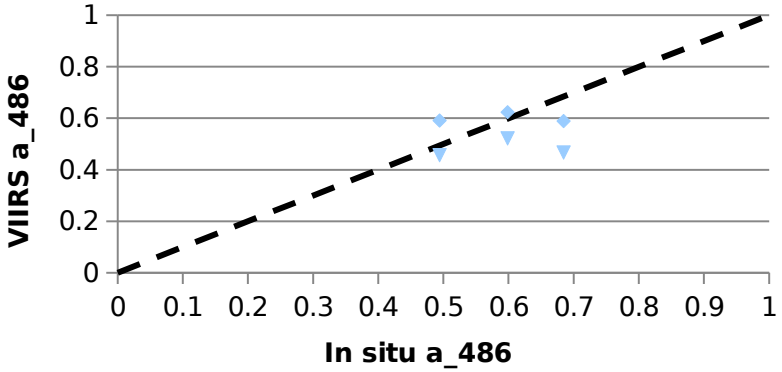


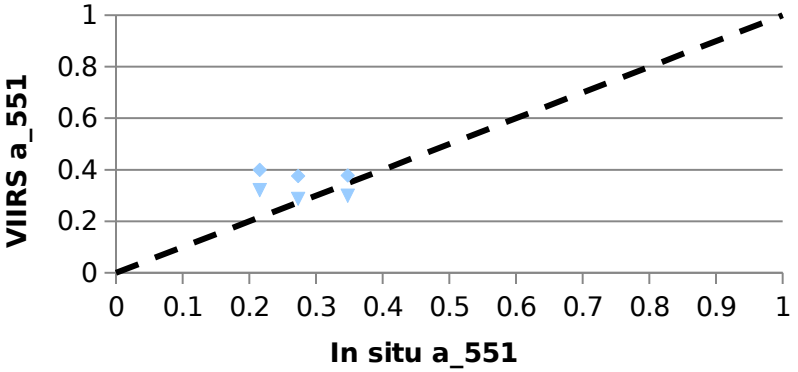






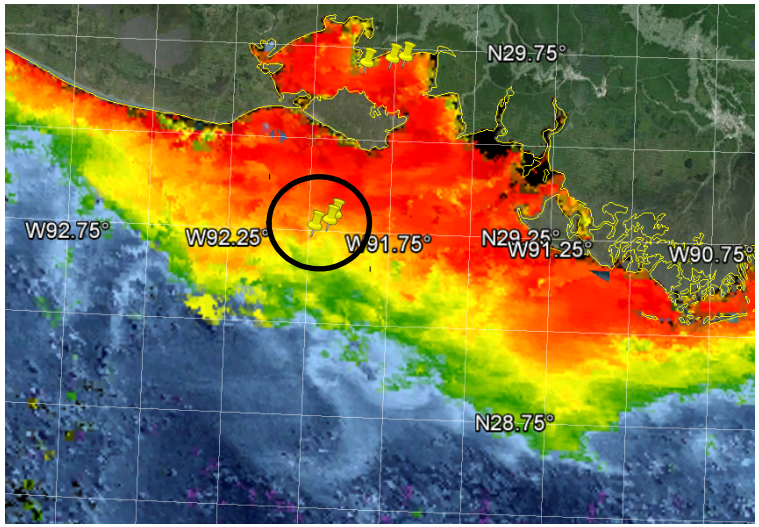


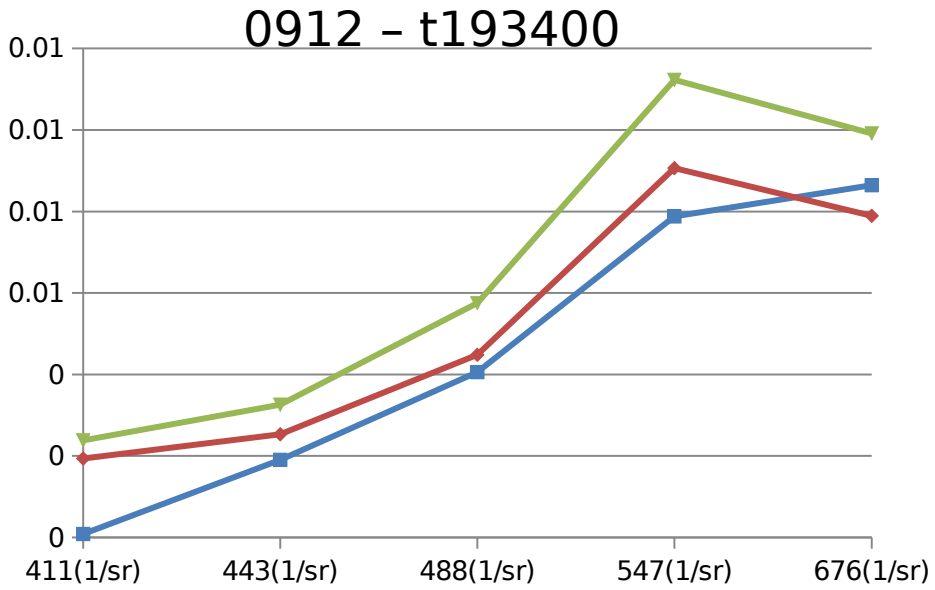




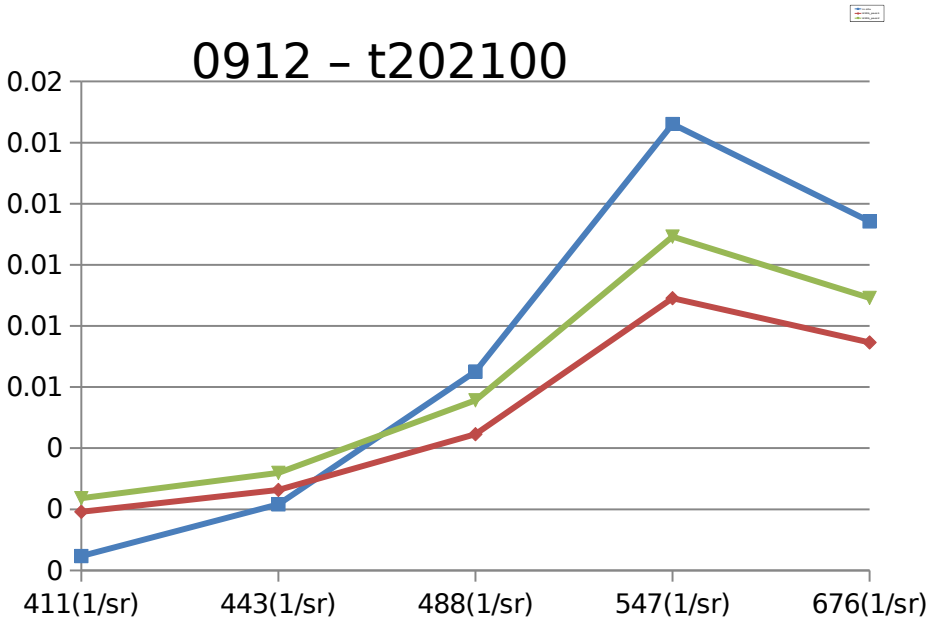
Zhongping Lee,
ac-9

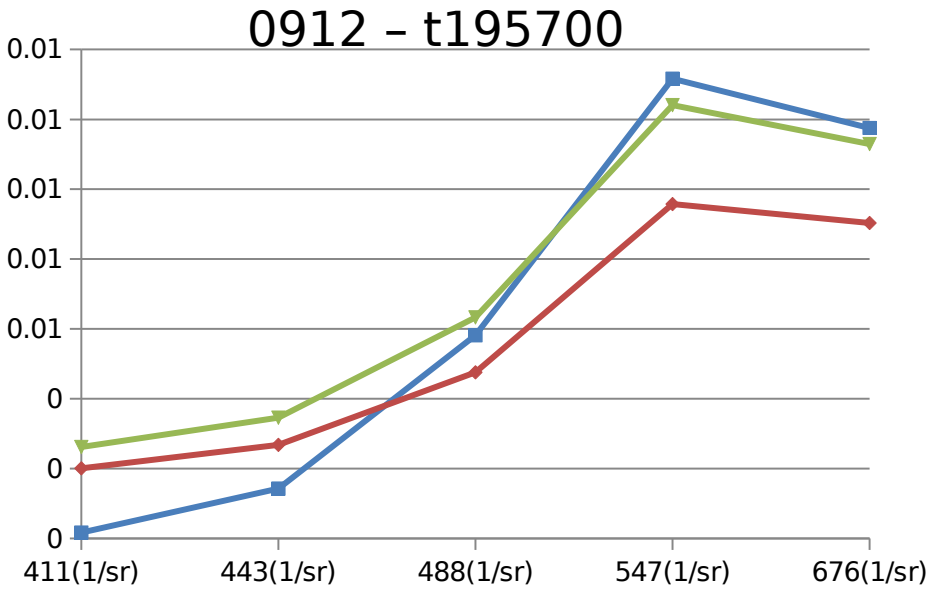
Overlap
comparison

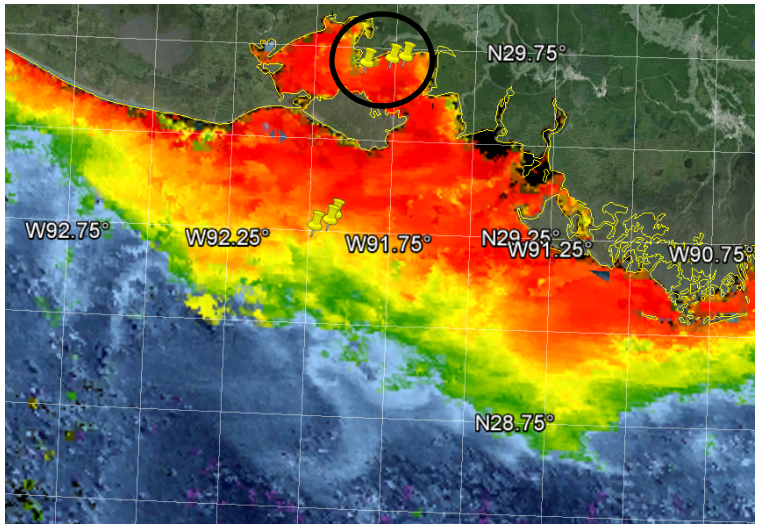




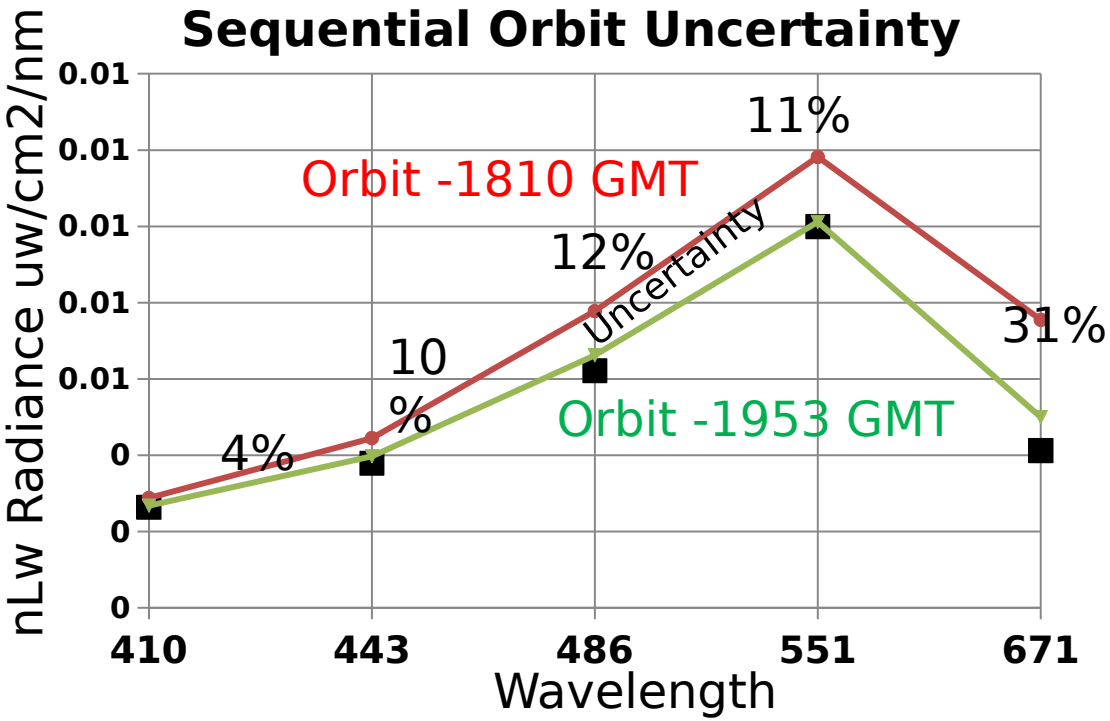
Mike Ondrusek, rrs

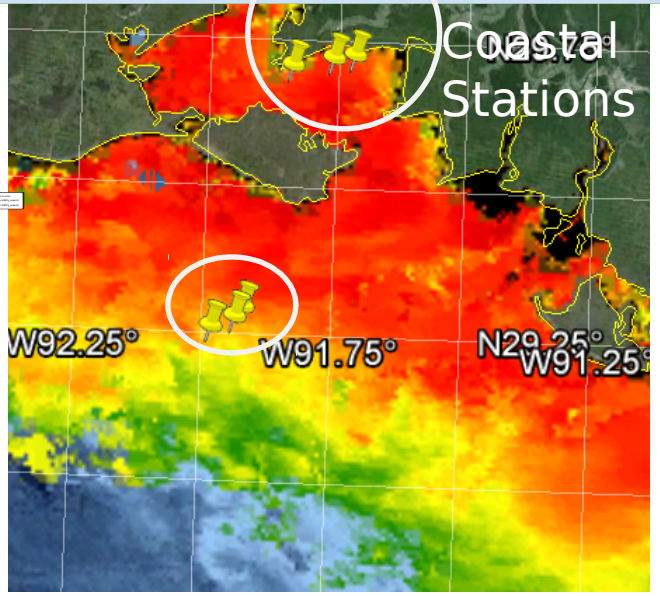


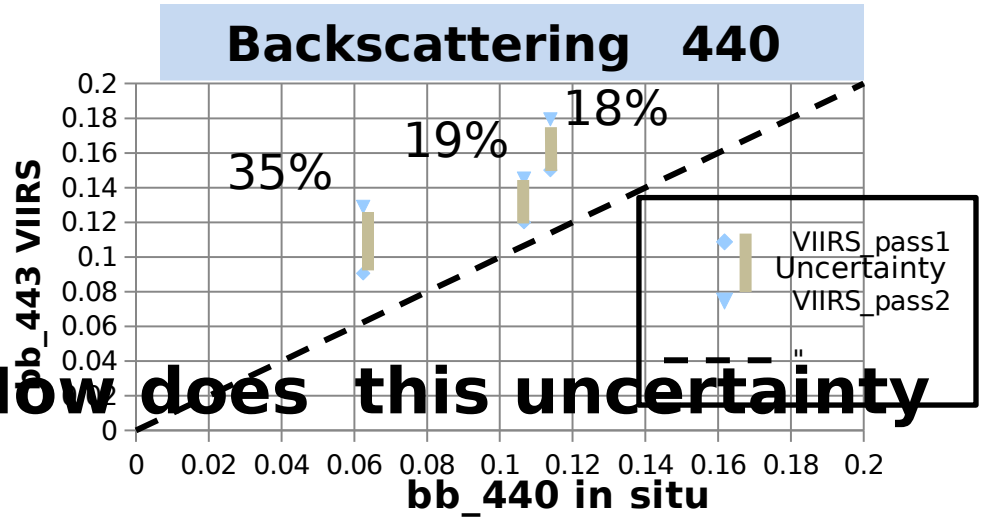


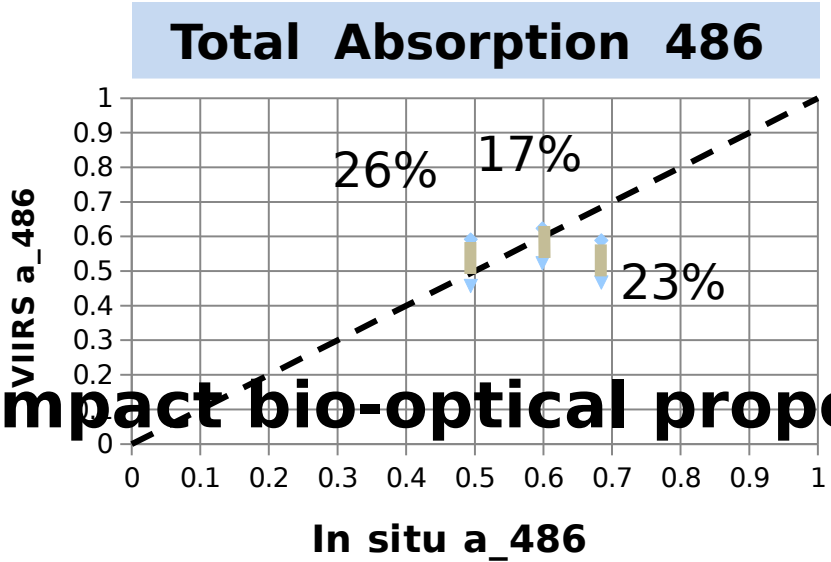


NPP-VIIRS validation using Orbital OverLap –Sept 12, 2013 - Northern Gulf





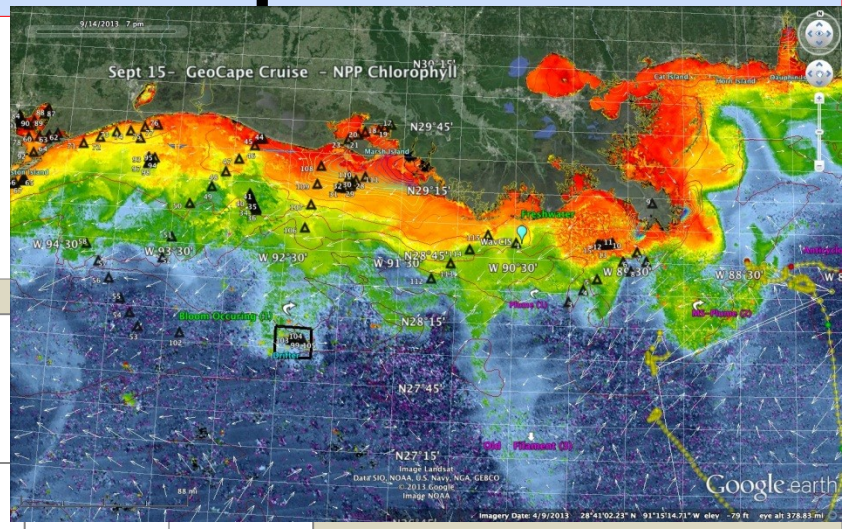




low does this uncertainty impact bio-optical proper

NPP Ocean product validation
Characterizing Satellite and insitu uncertainty
- Northern Gulf – GeoCape

nLw 551



8 %
In situ
uncertainty

15 %
satellite
uncertainty

VIIRS Rrs 551 (sr-1)

0.02
0.02
0.01
0.01
0
0

Satellite
Data pair

Insitu
Data
Pair

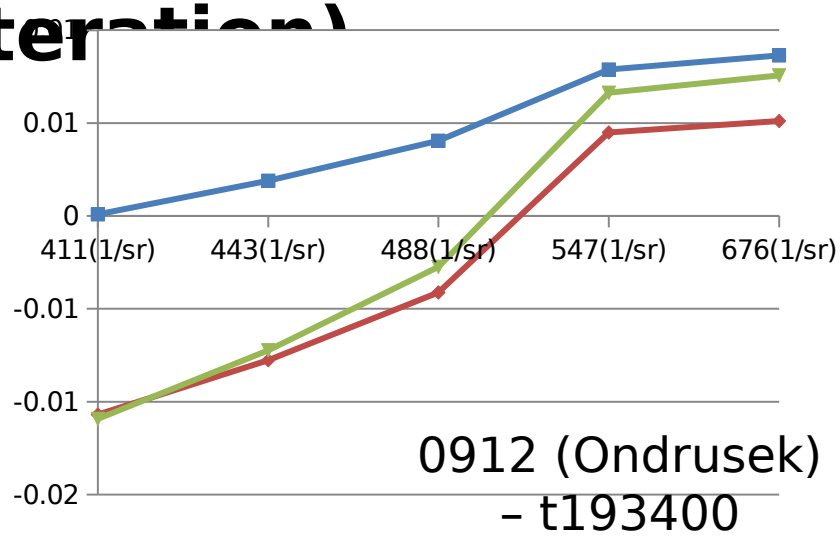
0
0.01
0.01
0.02
0.02

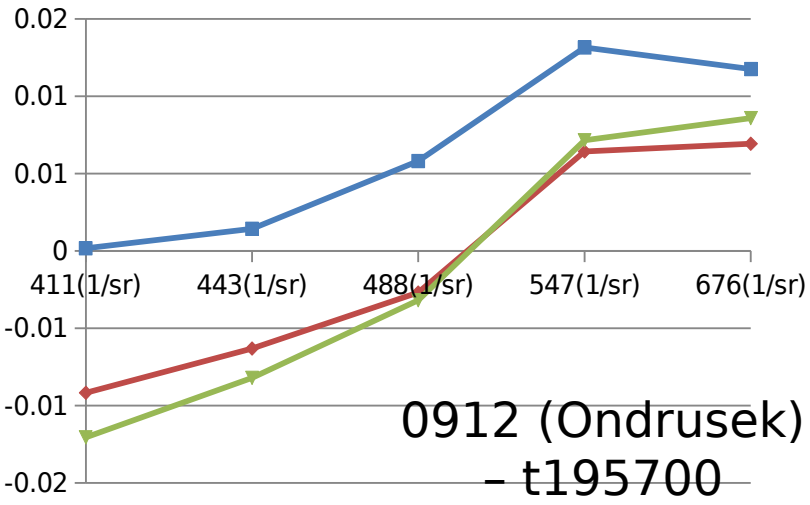
All_data 43
Simultaneous Points
Overlap
"

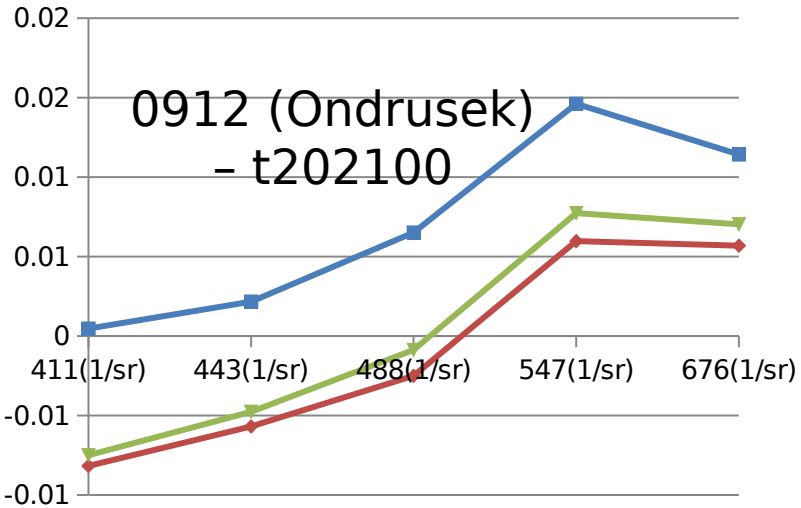
In situ Rrs 551 (sr-1)

Acknowledgements
M. Ondrusek / Z. Lee

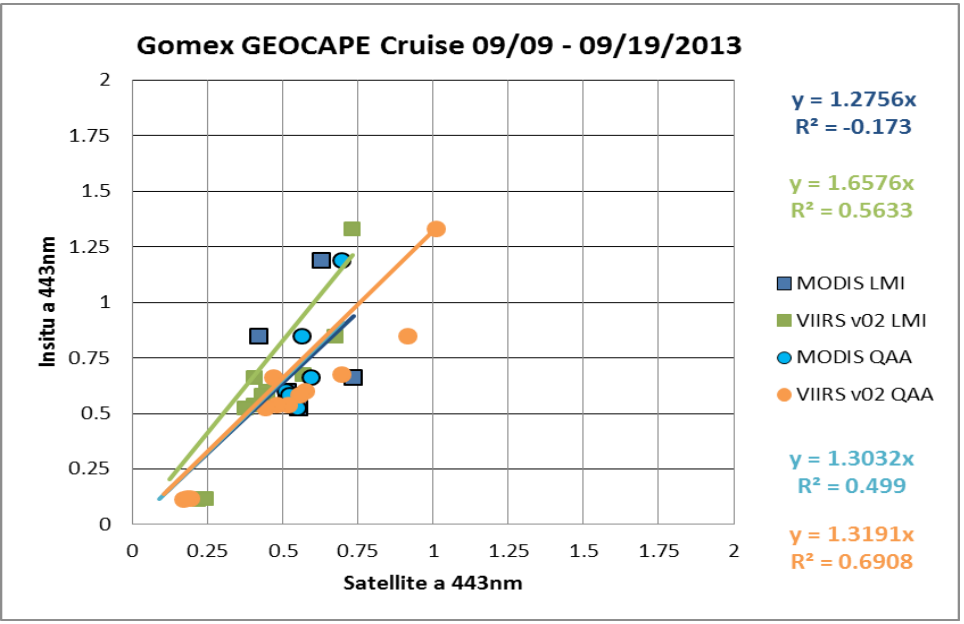
NOAA IDPS – VOCCO Matchups (Negative in Blue Channels – NO NIR Coastal Iteration)

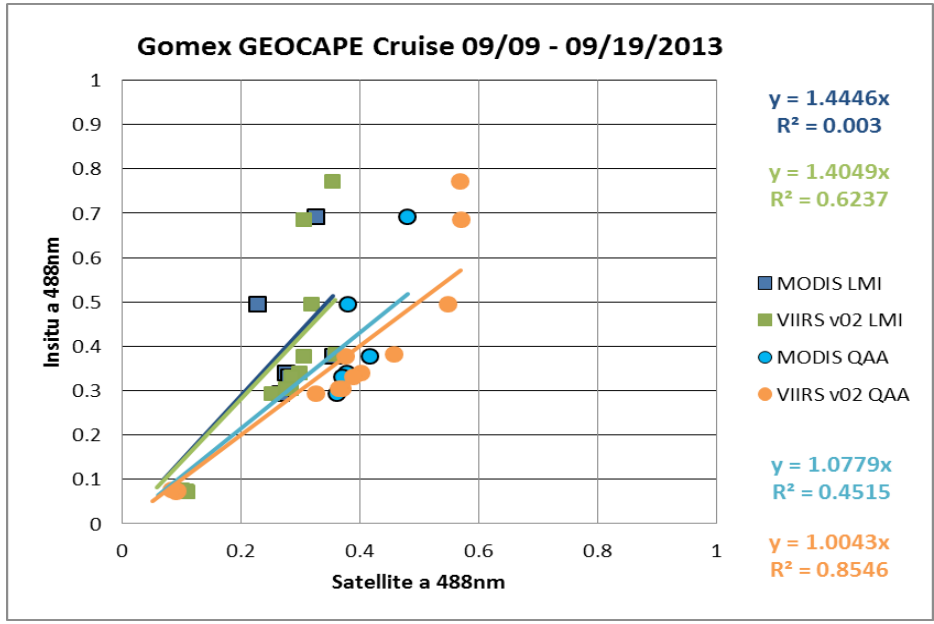


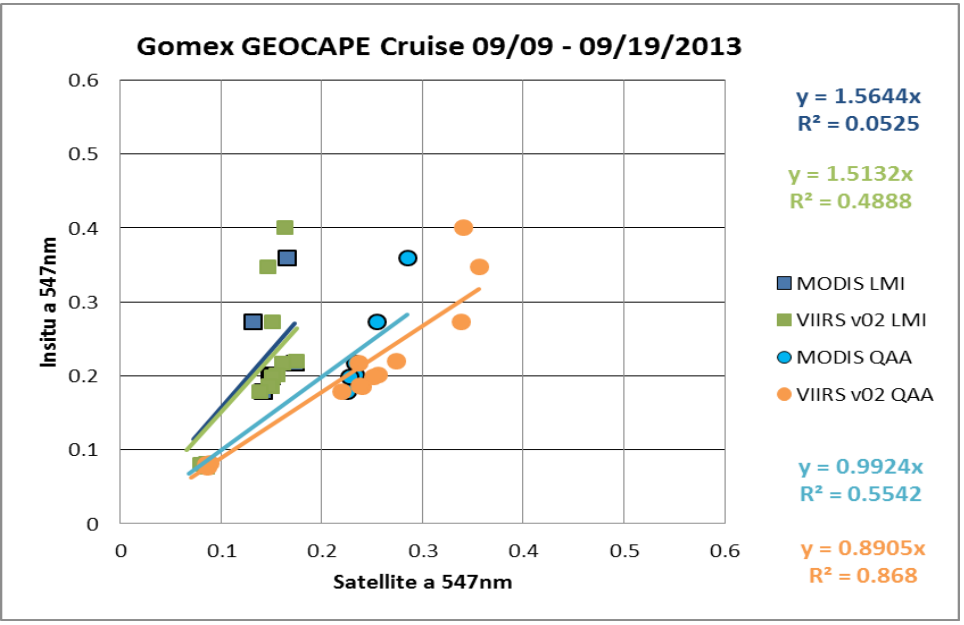




OCAPE / Northern Gulf of Mexico Cruise July 9-19, 2013 - Scatter





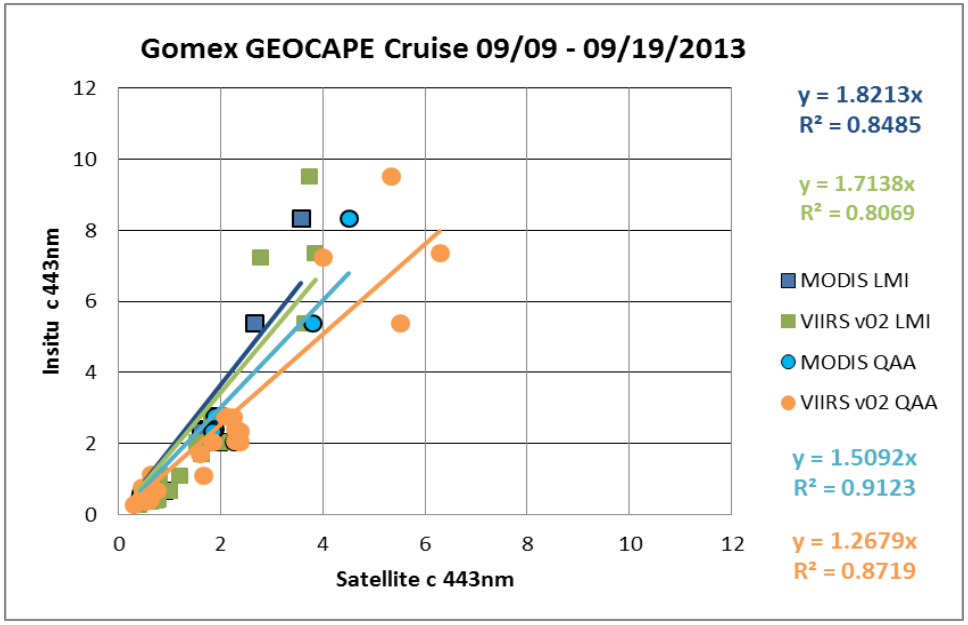


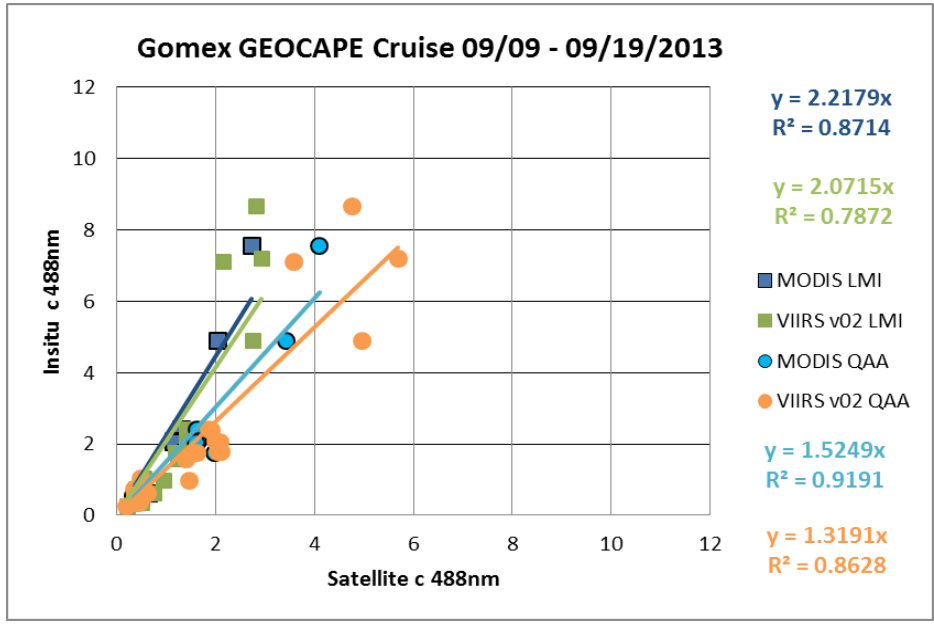
SLOPE	a412	a443	a488	a547	c412	c443	c488	c547
ModLMI	1.27	1.28	1.45	1.56	1.56	1.82	2.22	2.69
ModQAA	1.24	1.30	1.08	0.99	1.41	1.51	1.52	1.54
VIIRS LMI	1.42	1.66	1.40	1.51	1.33	1.71	2.07	2.59
VIIRS QAA	1.21	1.32	1.00	0.89	1.11	1.27	1.32	1.33
R2	a412	a443	a488	a547	c412	c443	c488	c547
ModLMI	0.01	0.02	0.05	0.06	0.91	0.92	0.94	0.95
ModQAA	0.20	0.78	0.75	0.99	0.92	0.93	0.93	0.93
VIIRS LMI	0.75	0.68	0.68	0.55	0.88	0.88	0.85	0.85
VIIRS QAA	0.79	0.73	0.87	0.87	0.86	0.88	0.87	0.87

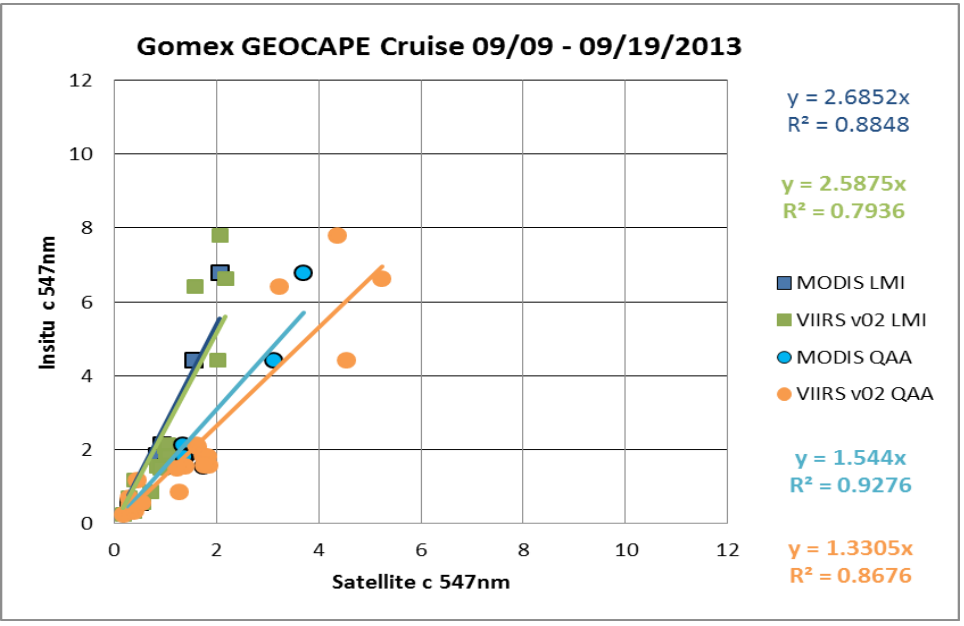
Insitu: UMASS/NOAA

For total absorption, VIIRS performing slightly better than MODIS

OCAPE / Northern Gulf of Mexico Cruise July 9-19, 2013 - Scatter



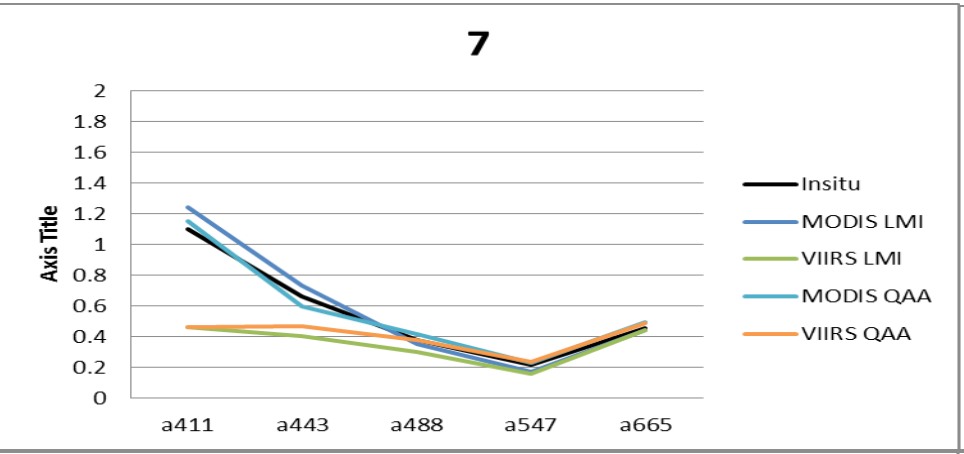


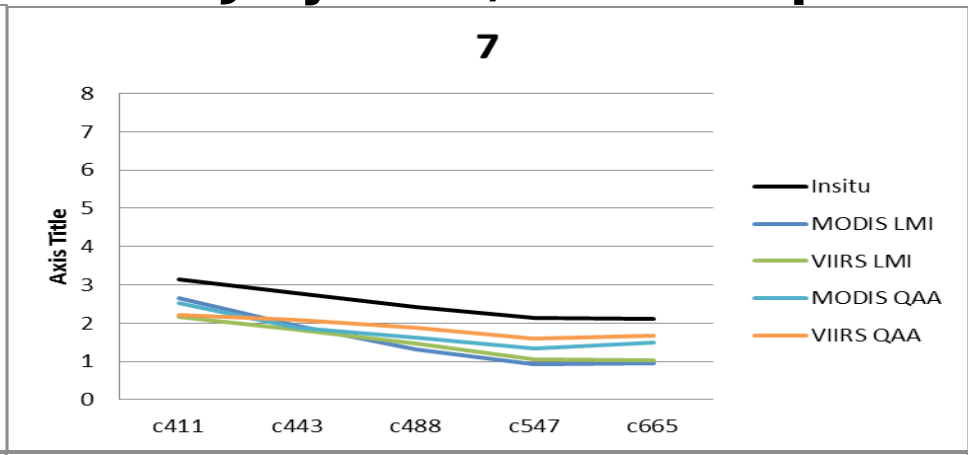


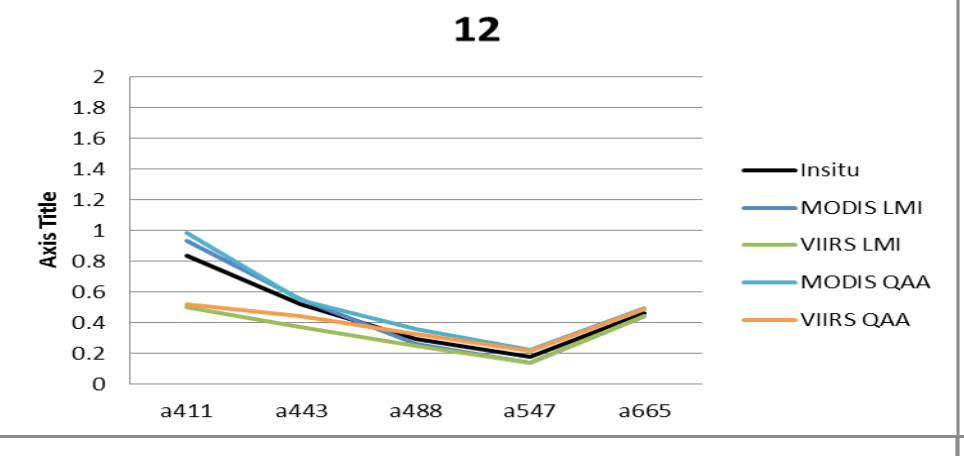
SLOPE	a412	a443	a488	a547	c412	c443	c488	c547
ModLMI	1.27	1.28	1.45	1.56	1.56	1.82	2.22	2.69
ModQAA	1.24	1.30	1.08	0.99	1.41	1.51	1.52	1.54
VIIRS LMI	1.42	1.66	1.40	1.51	1.33	1.71	2.07	2.59
VIIRS QAA	1.21	1.32	1.00	0.89	1.11	1.27	1.32	1.33
R2	a412	a443	a488	a547	c412	c443	c488	c547
ModLMI	0.01	0.02	0.05	0.06	0.91	0.92	0.94	0.95
ModQAA	0.20	0.78	0.75	0.99	0.92	0.93	0.93	0.93
VIIRS LMI	0.75	0.68	0.68	0.55	0.88	0.88	0.85	0.85
VIIRS QAA	0.79	0.73	0.87	0.87	0.86	0.88	0.87	0.87

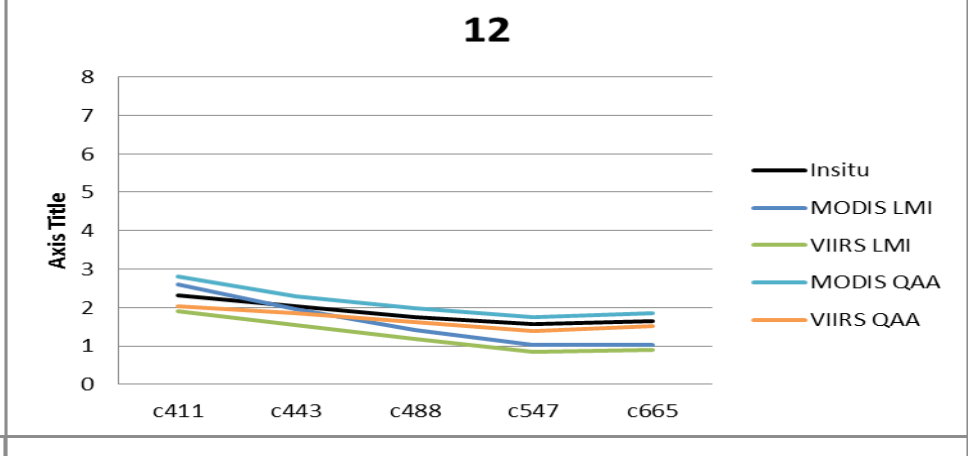
Insitu: UMASS/NOAA

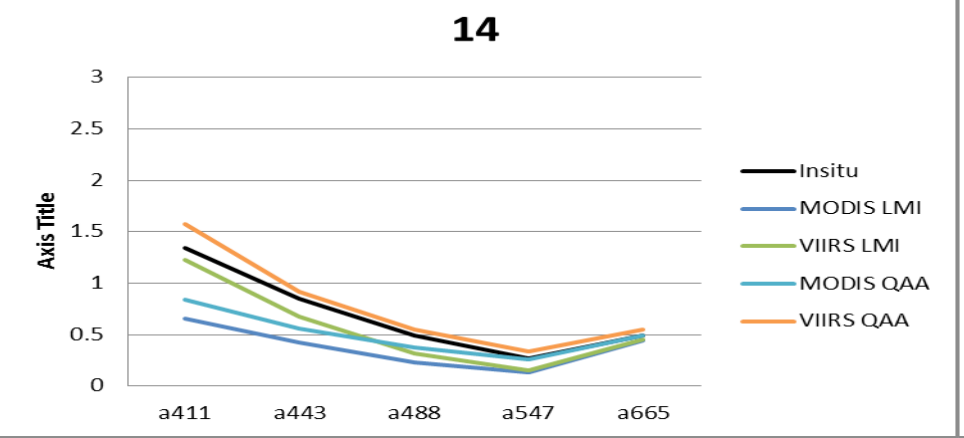
OCAPE / Northern Gulf of Mexico Cruise July 9-19, 2013 - Spectra

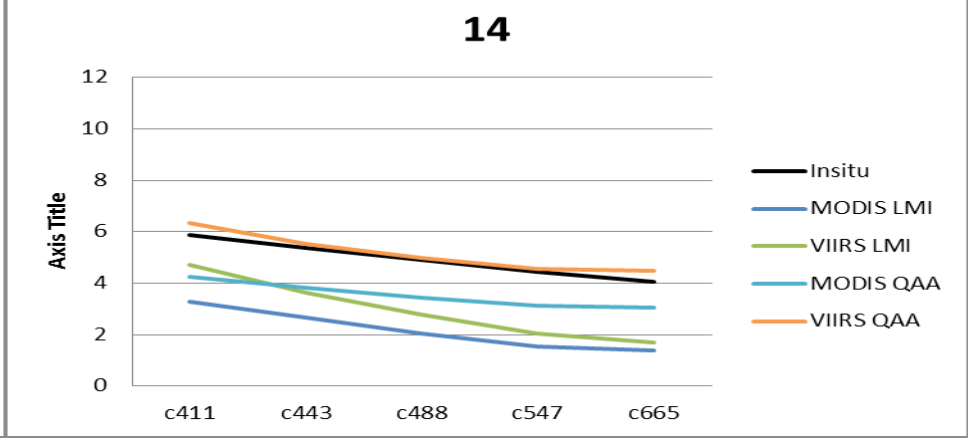




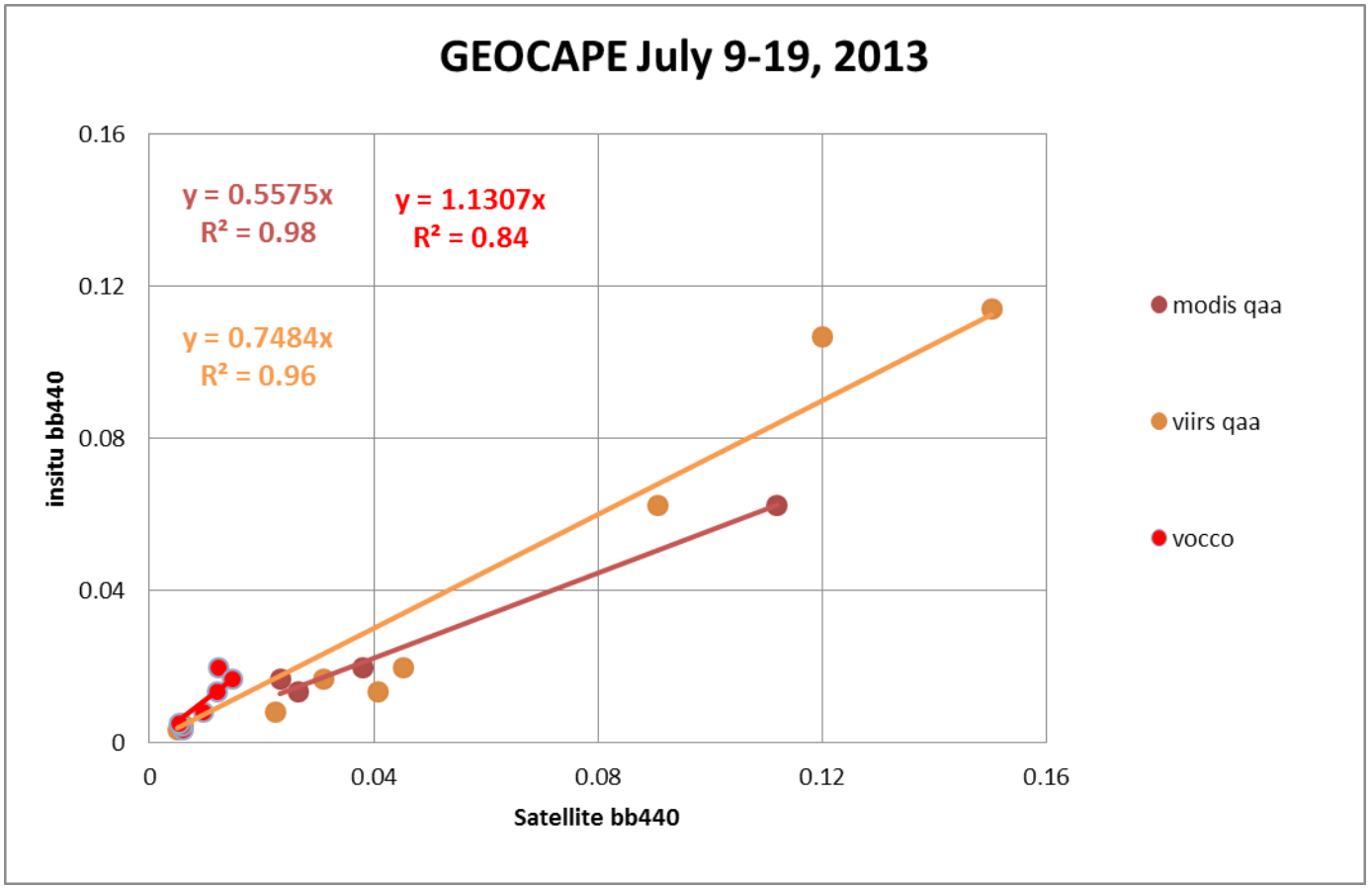






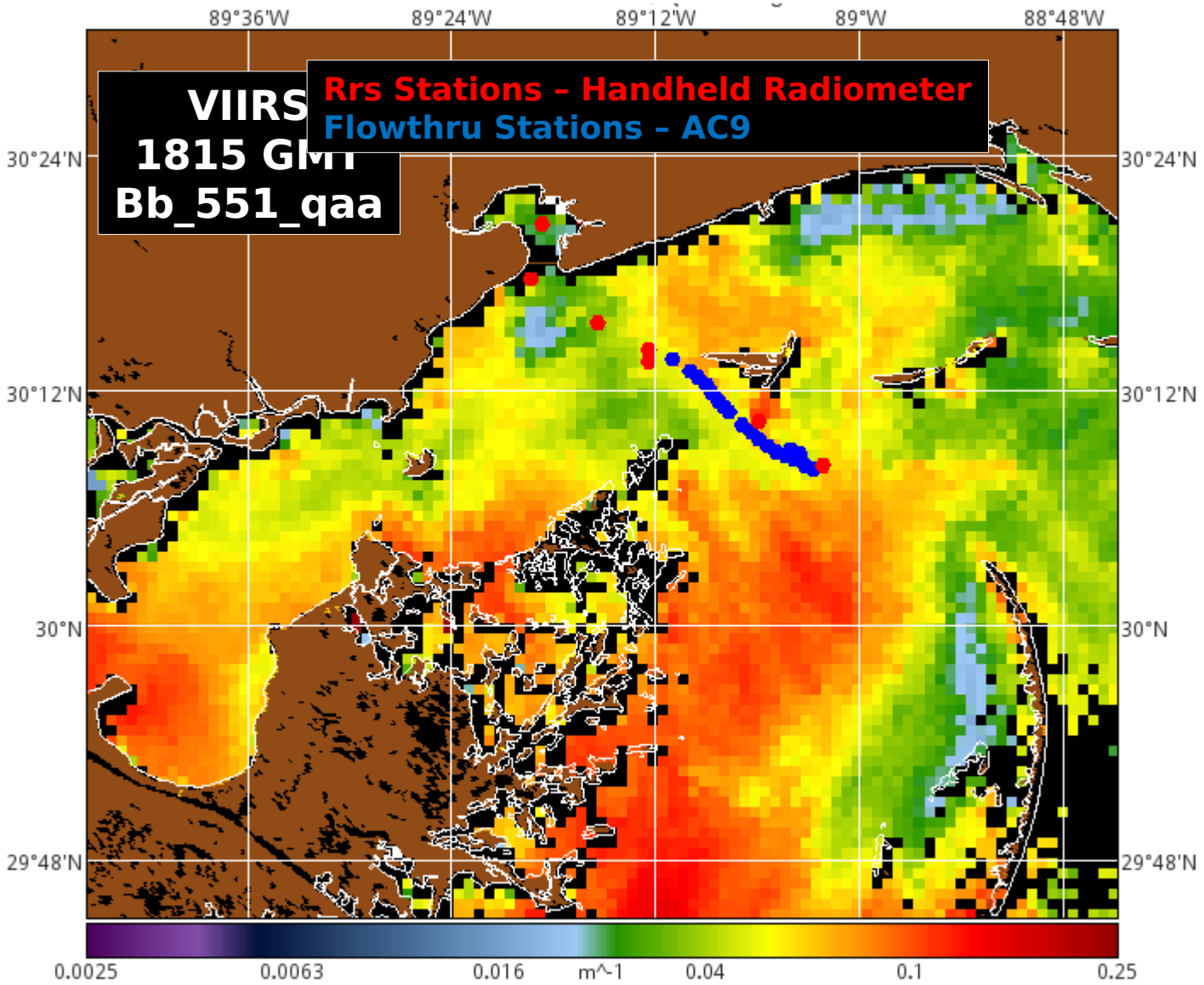


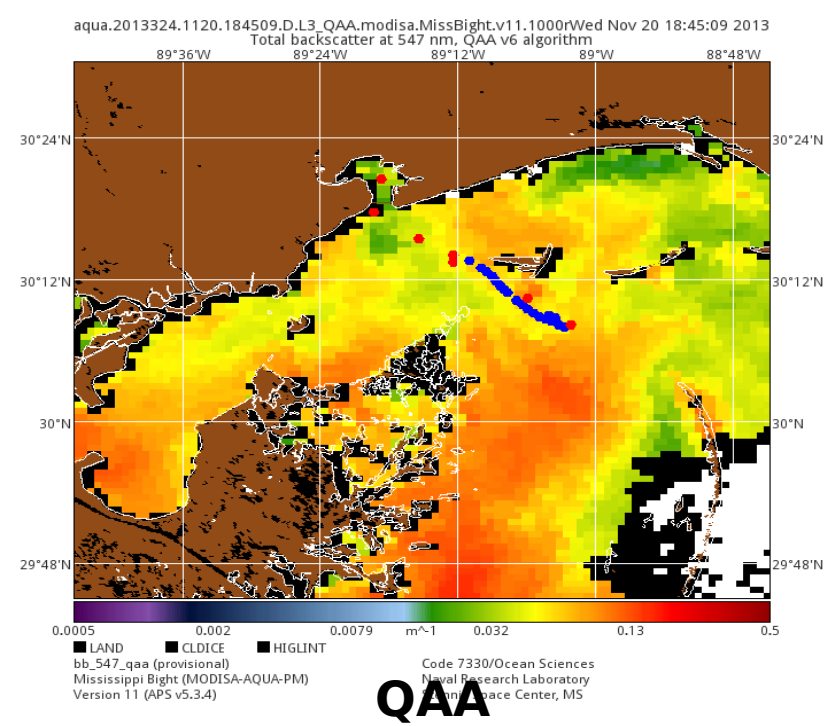
GEOCAPE / Northern Gulf of Mexico Cruise July 9-19, 2013 - Scat



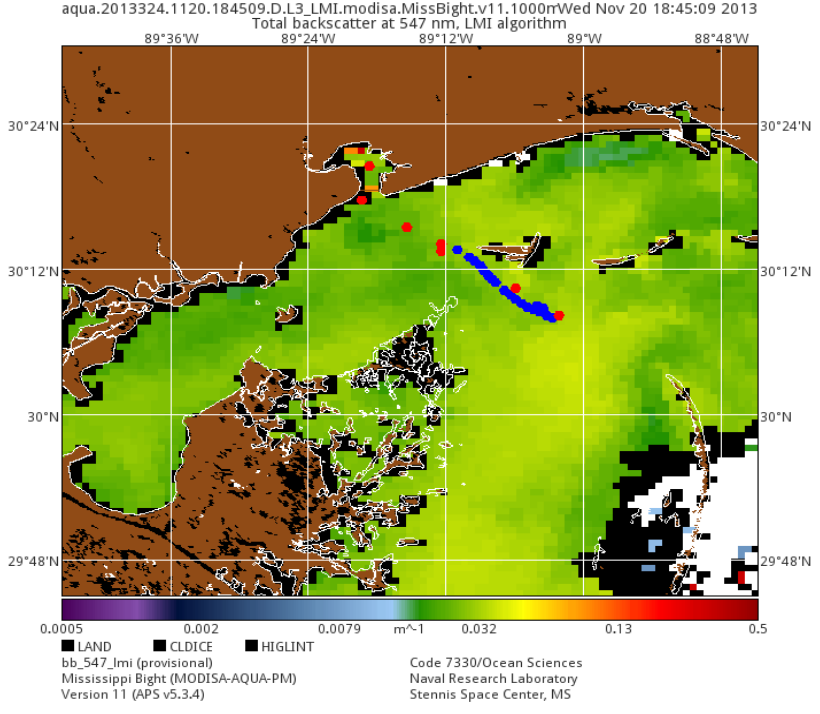
bb440	Rsquared	Slope
modis qaa	0.9895	0.5600
viirs qaa	0.9586	0.7500
vocco	0.8408	1.1300

cean Color Cruise – November 20, 2013 – Mississippi S
and IOP (Surface FlowThru +/- 30 Minutes from Satell

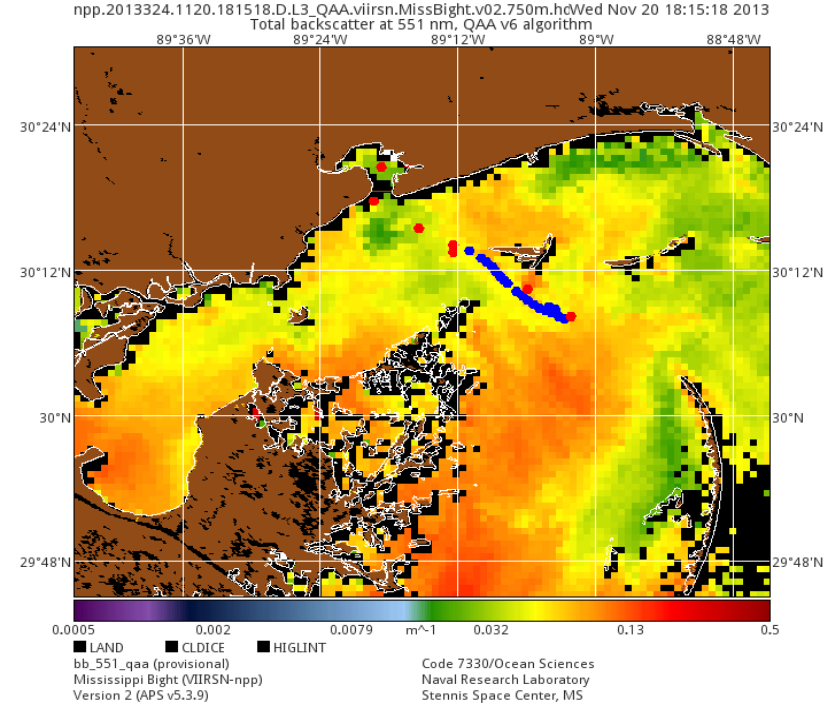




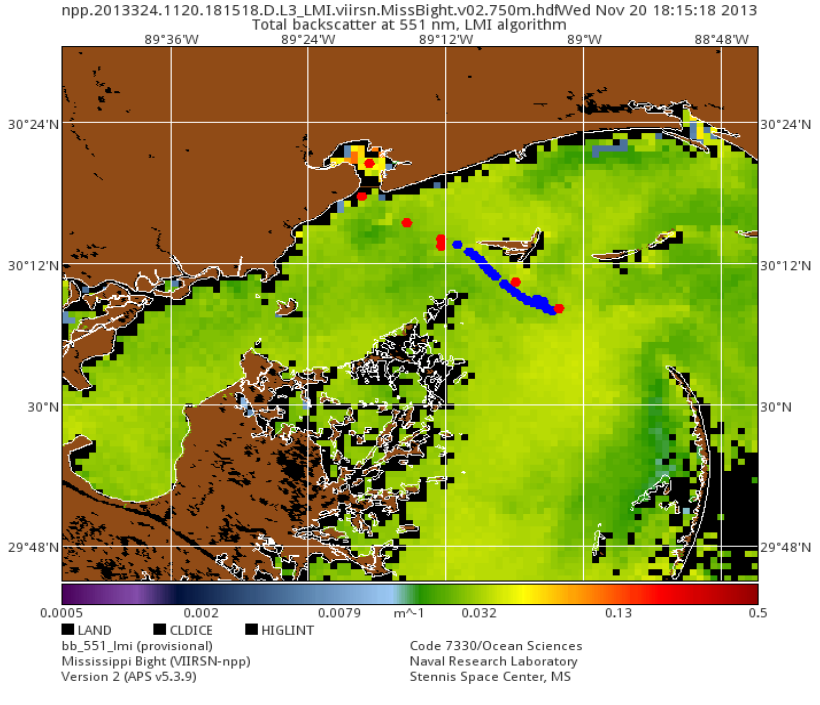
MODIS



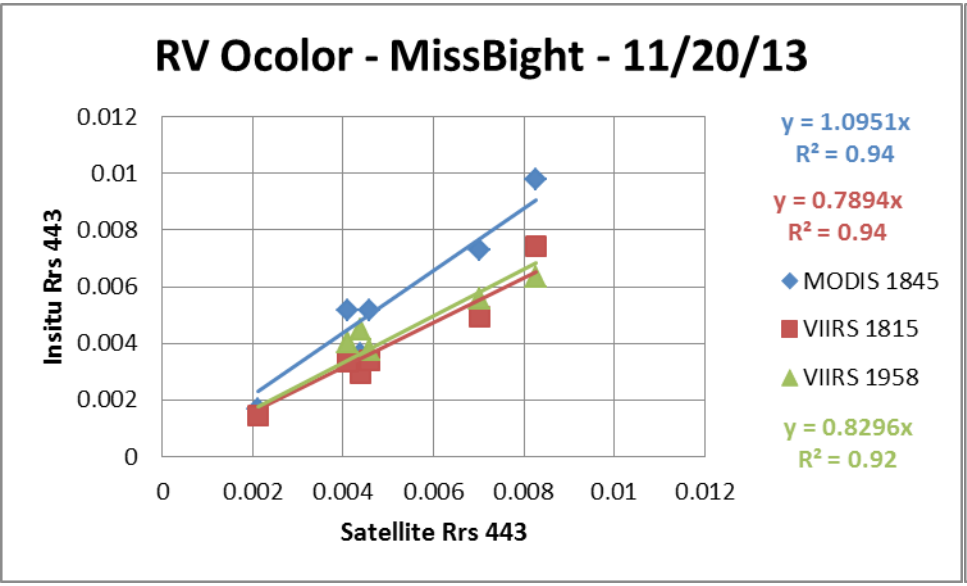
QAA

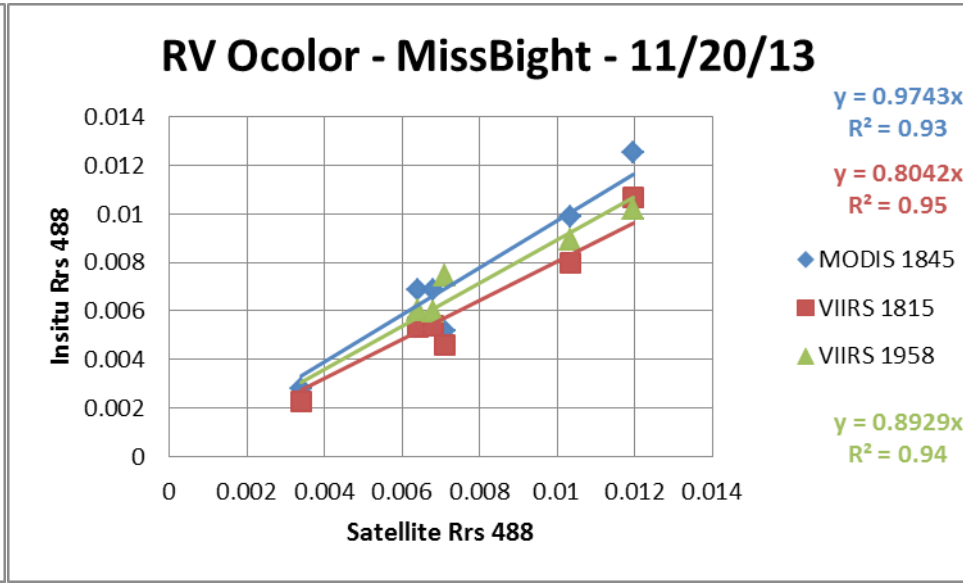


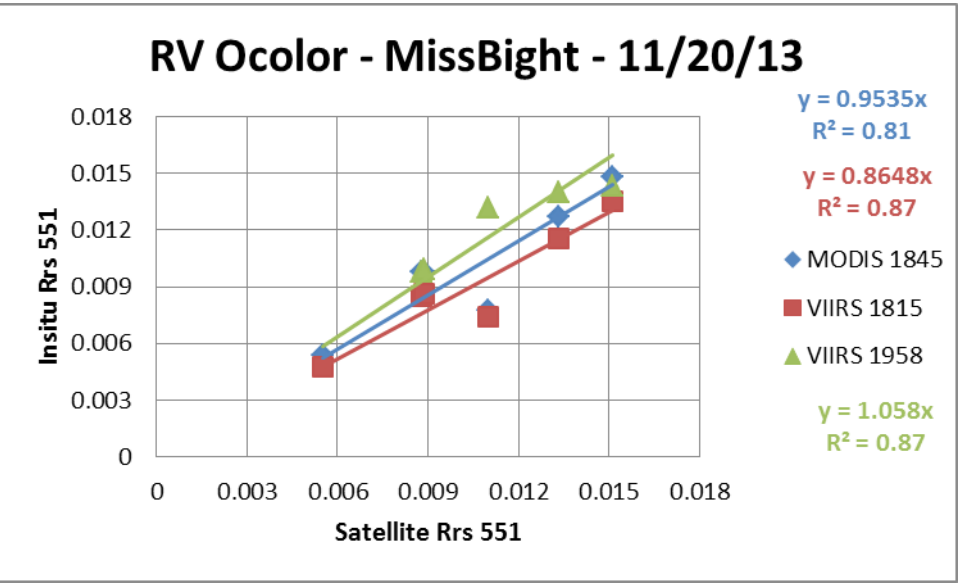
VIIRS



Ocean Color Cruise Mississippi Sound November 20, 2013 - Sca



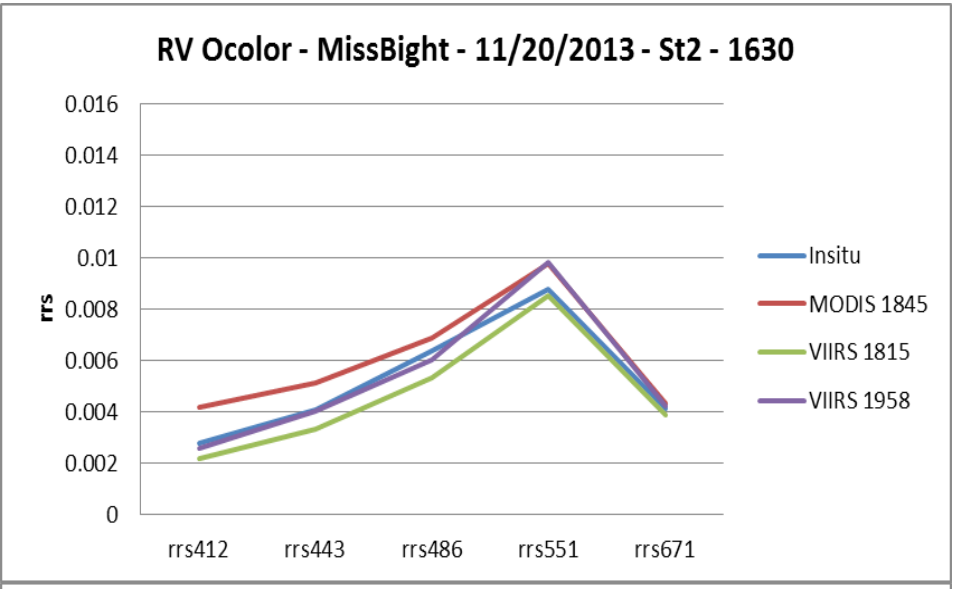


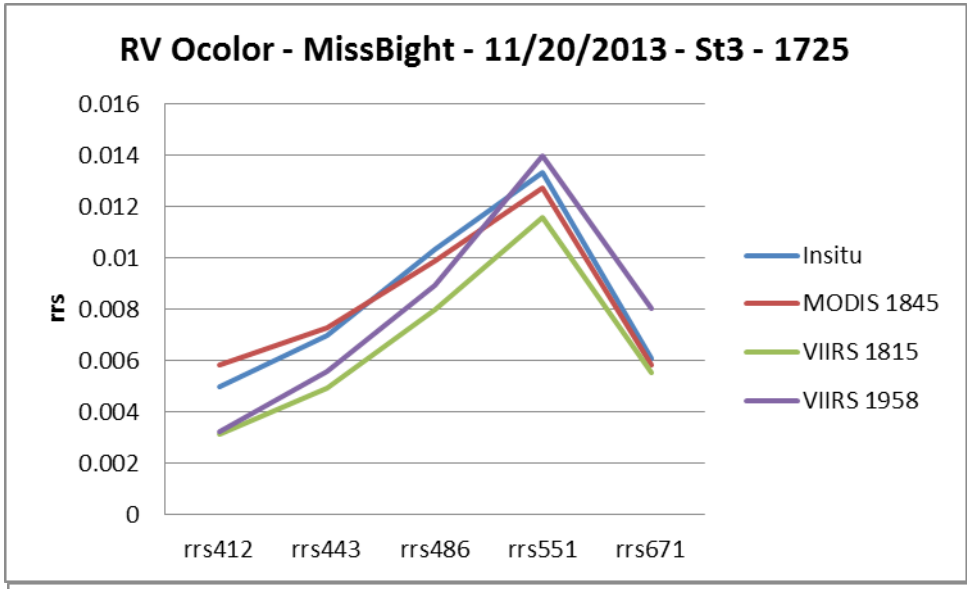


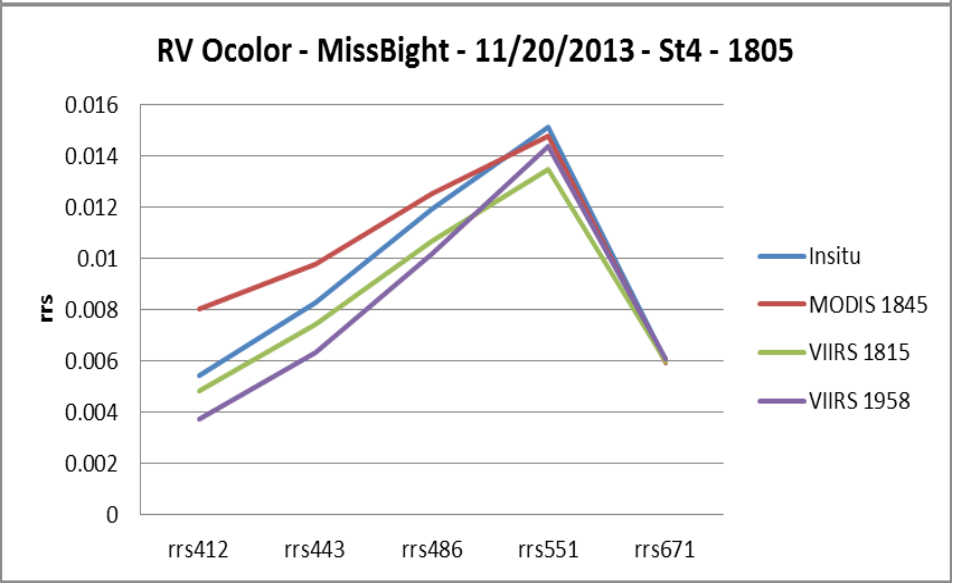
Slope	rrs412	rrs443	rrs488	rrs547
MODIS 1845	1.31	1.09	0.97	0.95
VIIRS 1815	0.76	0.79	0.80	0.86
VIIRS 1957	0.77	0.83	0.89	1.06

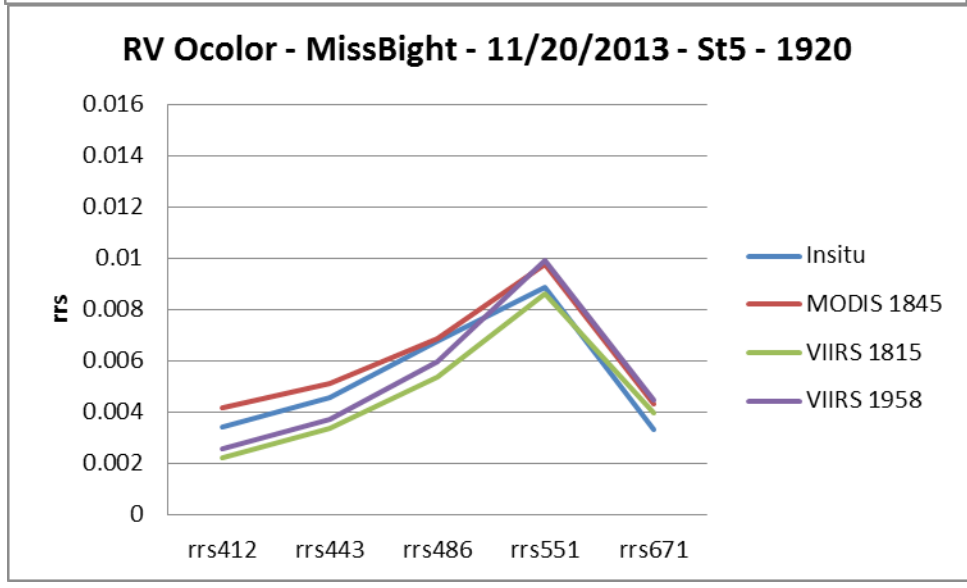
Rsquared	rrs412	rrs443	rrs488	rrs547
MODIS 1845	0.93	0.94	0.93	0.81
VIIRS 1815	0.85	0.94	0.95	0.87
VIIRS 1957	0.28	0.92	0.94	0.87

Ocean Color Cruise Mississippi Sound November 20, 2013 - Spe



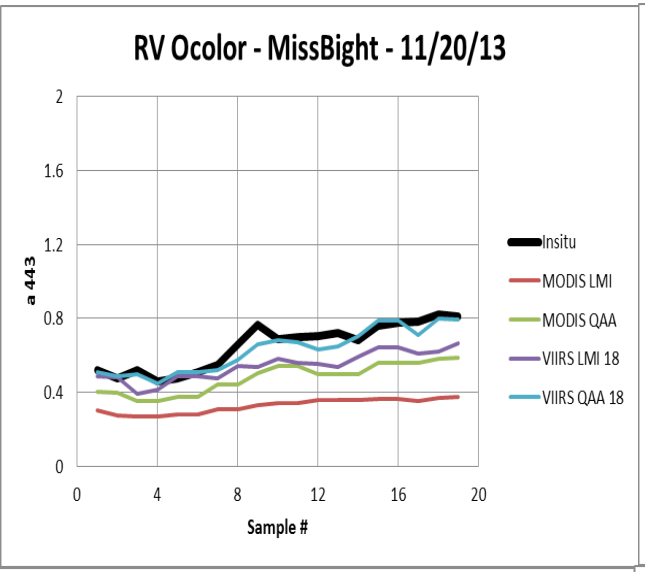


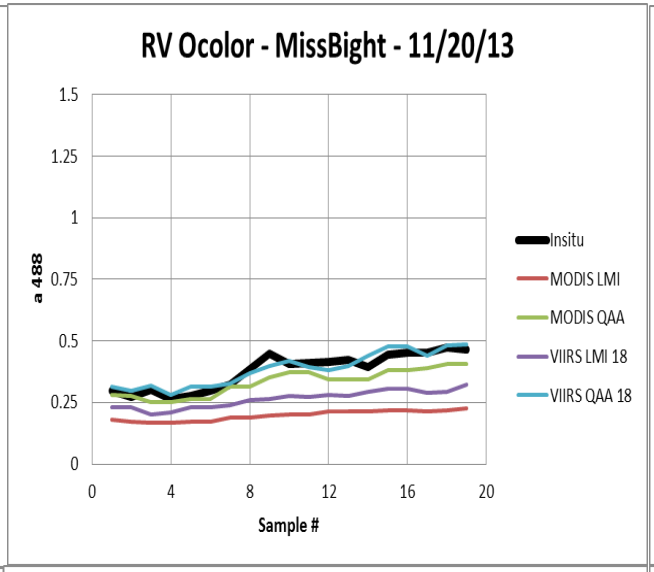


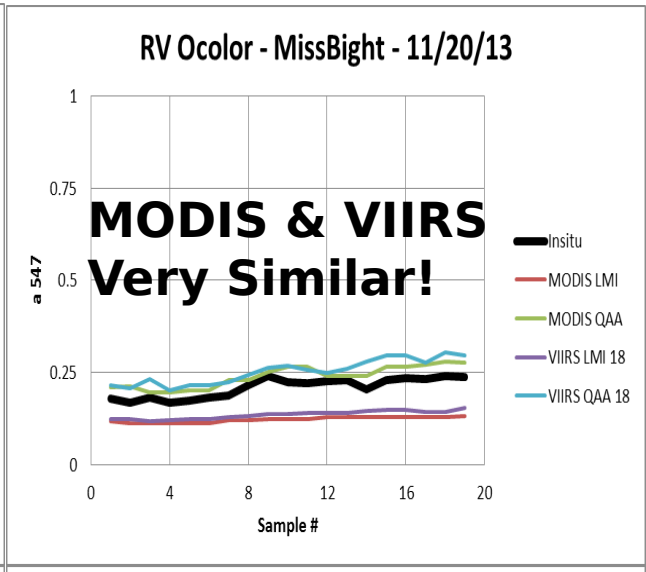


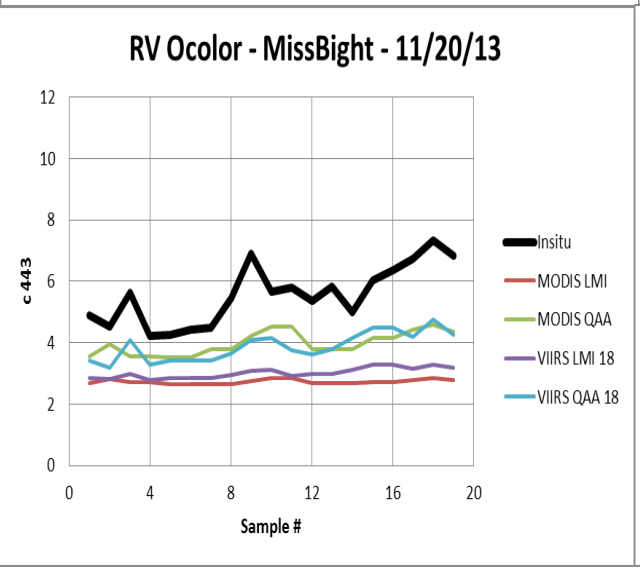
R/V Ocean Color Cruise Mississippi Sound November 20, 2013

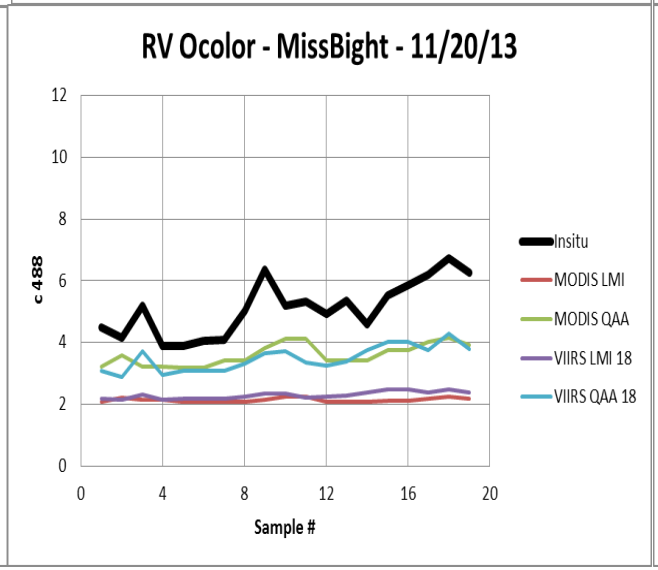
FlowThru (+/- 30 minutes of early/late satellite pass)

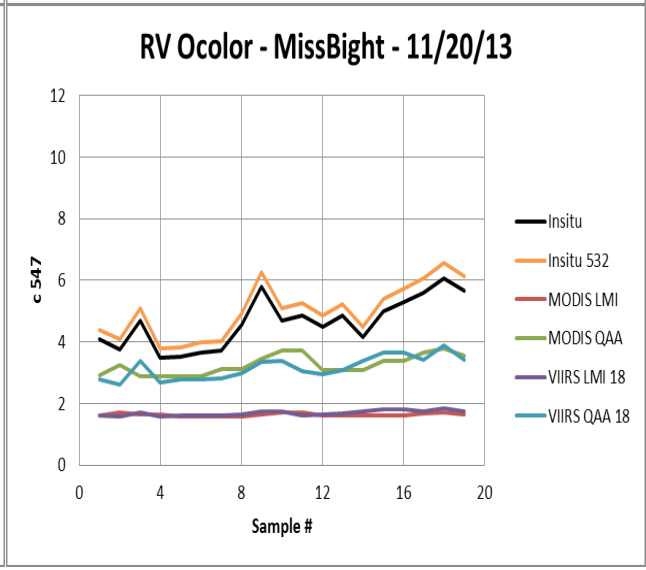








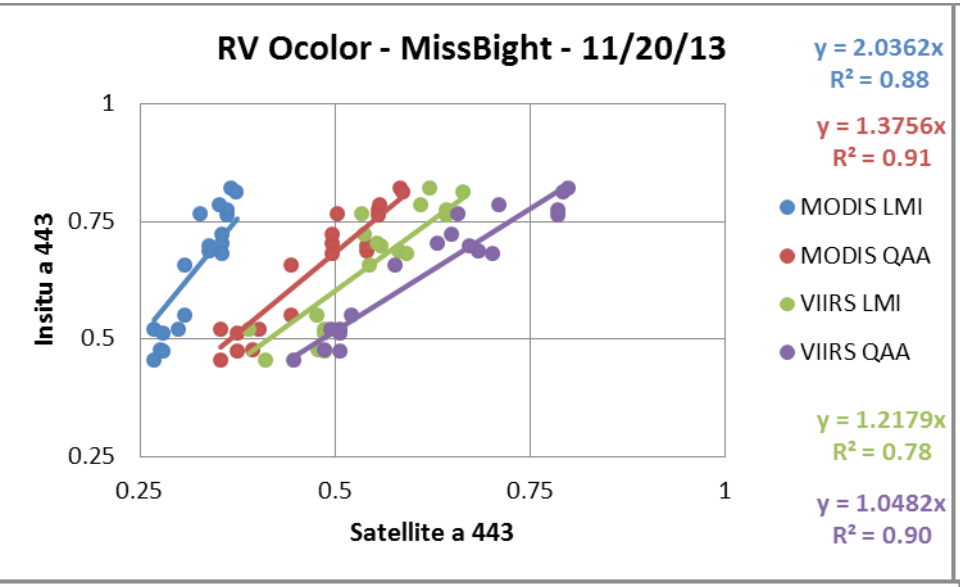


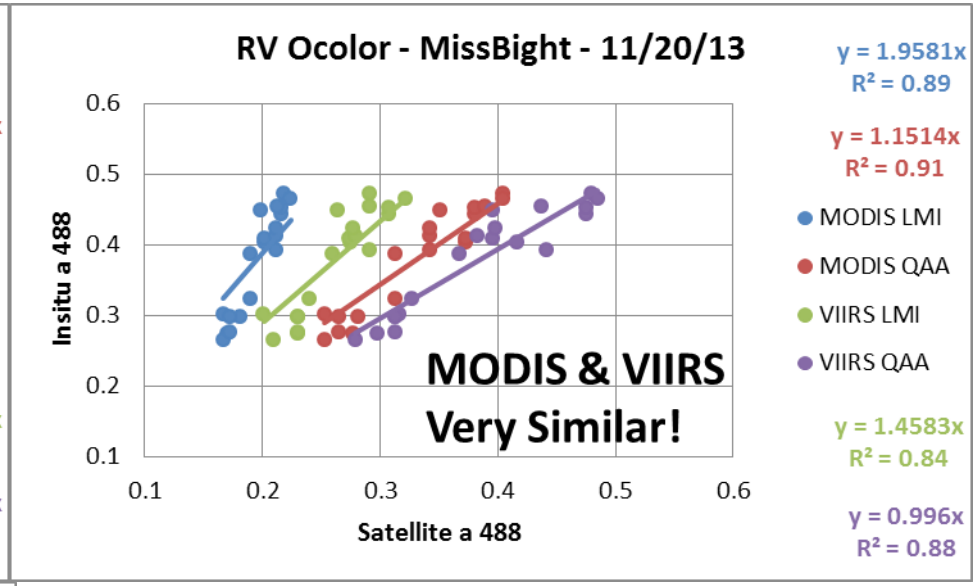


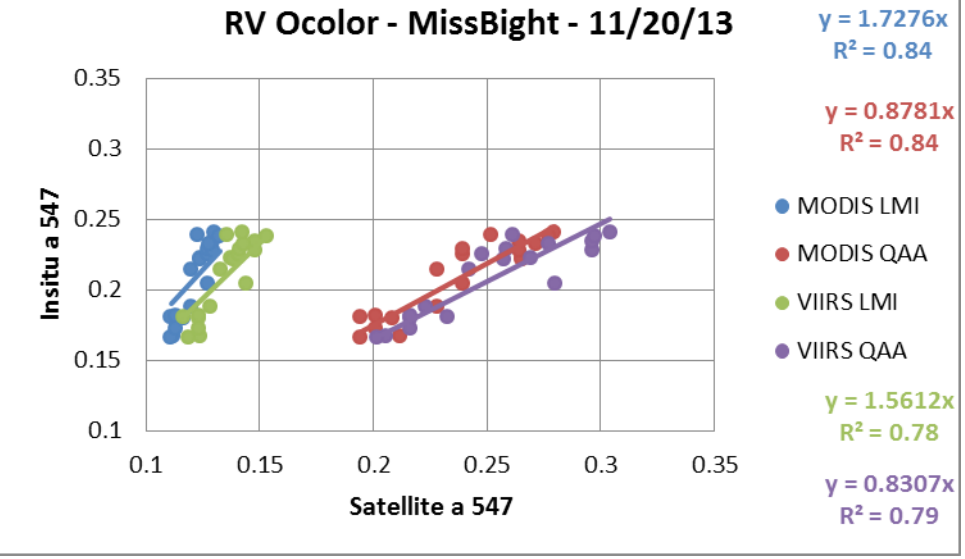
Satellite bb/b **Insitu profile bb/b**

R/V Ocean Color Cruise Mississippi Sound November 20, 2013

FlowThru (+/- 30 minutes of early/late satellite pass)





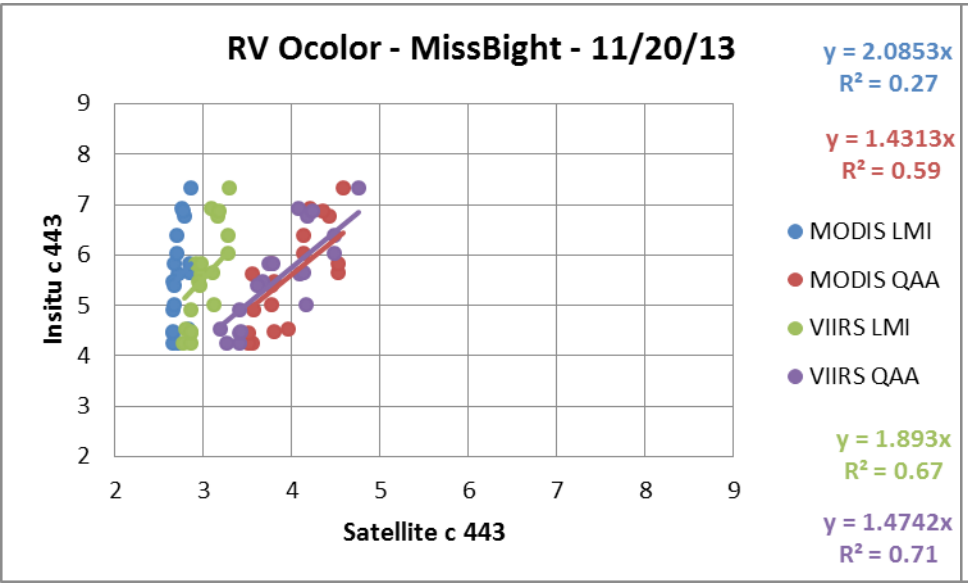


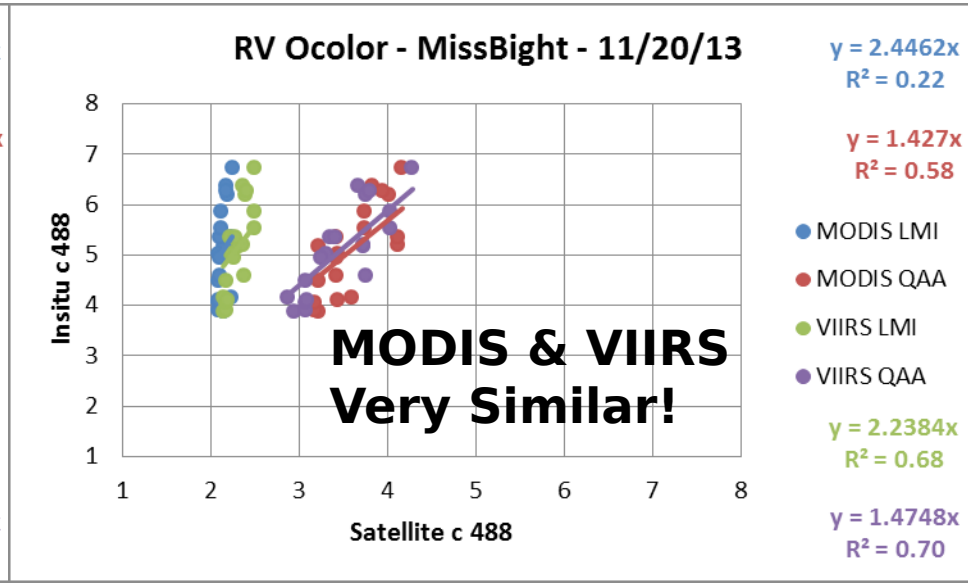
SLOPE	a412	a443	a488	a547
ModLMI	1.95	2.03	1.96	1.73
ModQAA	1.48	1.38	1.15	0.88
VIIRSLMI	0.93	1.22	1.46	1.56
VIIRSQAA	0.85	1.05	0.99	0.83

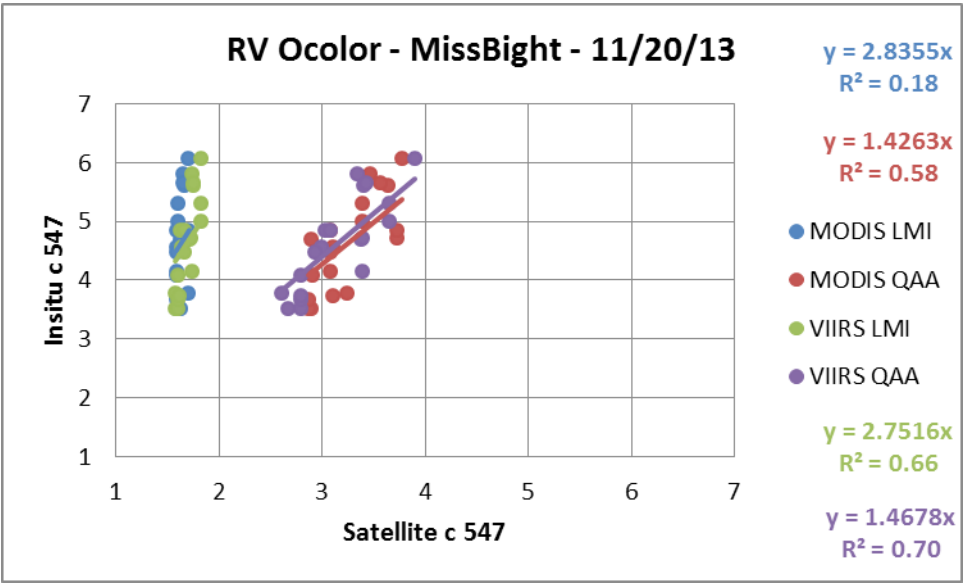
R2	a412	a443	a488	a547
ModLMI	0.86	0.88	0.89	0.84
ModQAA	0.90	0.91	0.91	0.84
VIIRSLMI	0.72	0.78	0.84	0.78
VIIRSQAA	0.80	0.90	0.88	0.79

R/V Ocean Color Cruise Mississippi Sound November 20, 2013

FlowThru (+/- 30 minutes of early/late satellite pass)







SLOPE	c412	c443	c488	c547
ModLMI	1.84	2.09	2.45	2.84
ModQAA	1.41	1.43	1.43	1.43
VIIRSLMI	1.56	1.89	2.24	2.75
VIIRSQAA	1.37	1.47	1.48	1.47

R2	c412	c443	c488	c547
ModLMI	0.31	0.27	0.22	0.18
ModQAA	0.59	0.59	0.58	0.58
VIIRSLMI	0.67	0.69	0.68	0.66
VIIRSQAA	0.71	0.72	0.70	0.70

Evaluation of GOCI, MODIS, and VIIRS Imagery
Objective

- Evaluate current NRL processing of GOCI level 1b water leaving radiance (nL_w)
- Provide an inter-sensor comparison between GOCI, MODIS, and VIIRS remote sensing reflectances
- Compare GOCI, MODIS, and VIIRS with East China Sea Aeronet Ocean Color (Gageocho and Ieodo) data

2014 AGU OCEAN SCIENCES (Crout, et.al.)

Evaluation of GOCI, MODIS, and VIIRS Imagery
Background - Data

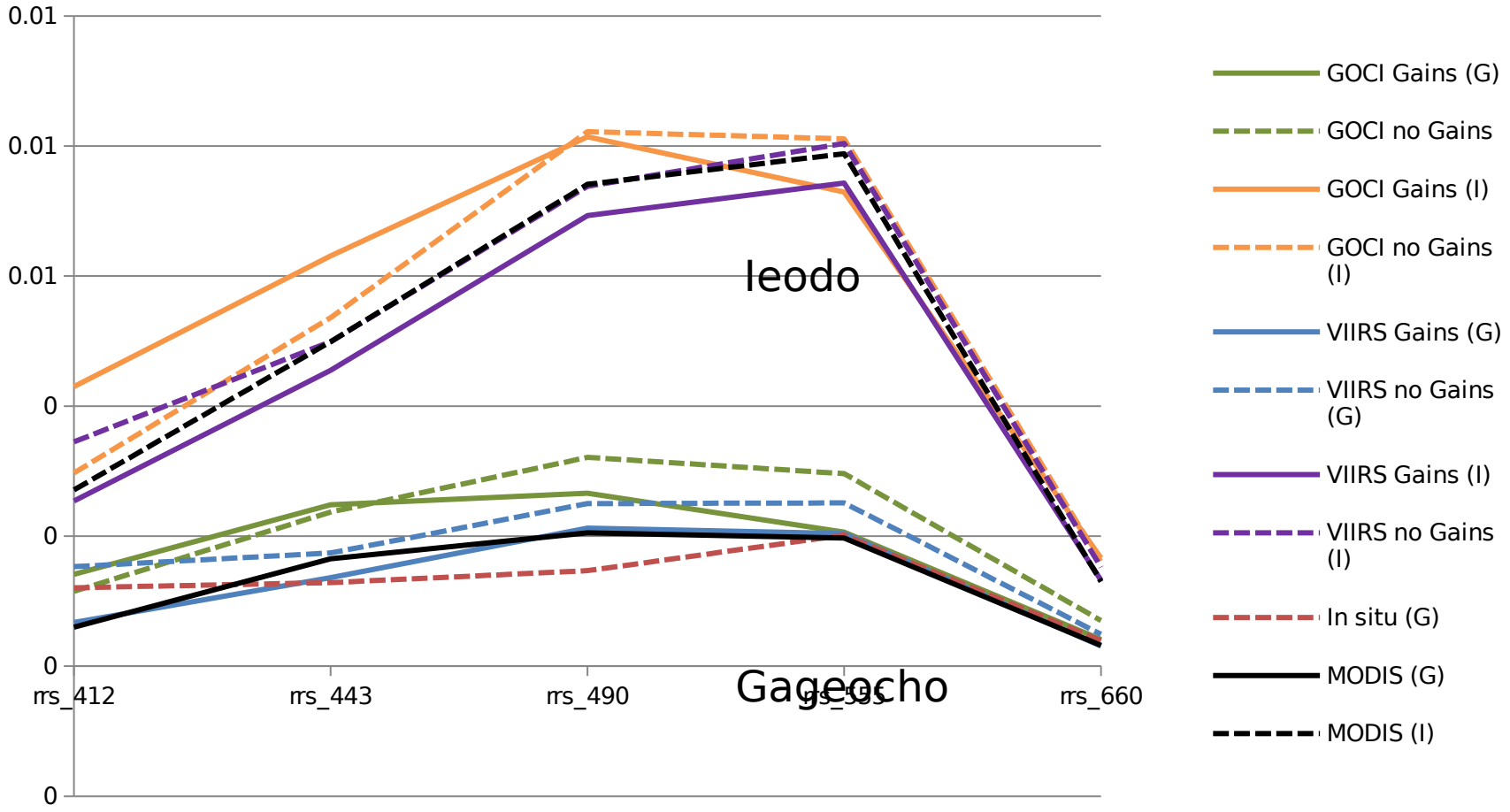
- MODIS
  - Processed with MOBY gains
- VIIRS
  - Processed with MOBY gains
- GOCI
  - Processed with MODIS-SWIR-derived vicarious calibration gains
  - GOCI data from 4Z GTM (corresponds to local 1 pm)
    - Reduces sun glint and sensor issues
- Aeronet SeaPrism
  - Gageocho Aeronet (SeaPrism #624) was moved to Ieodo
    - Results in a data gap from May 2012 – December 2013
    - The quality control of the data is near real time?

Evaluation of GOCI, MODIS, and VIIRS Imagery
Background - Processing

- Operational Ocean Color Processing
  - NRL's Automated Processing System (APS) based on n2gen software (NRL/NASA R&D)
  - Level 1b data obtained from NOAA CLASS (MODIS) and NAVO (GOCI and MODIS)
  - Atmospheric correction using Gordon-Wang NIR with 80 aerosol models
  - Glint and cloud removal

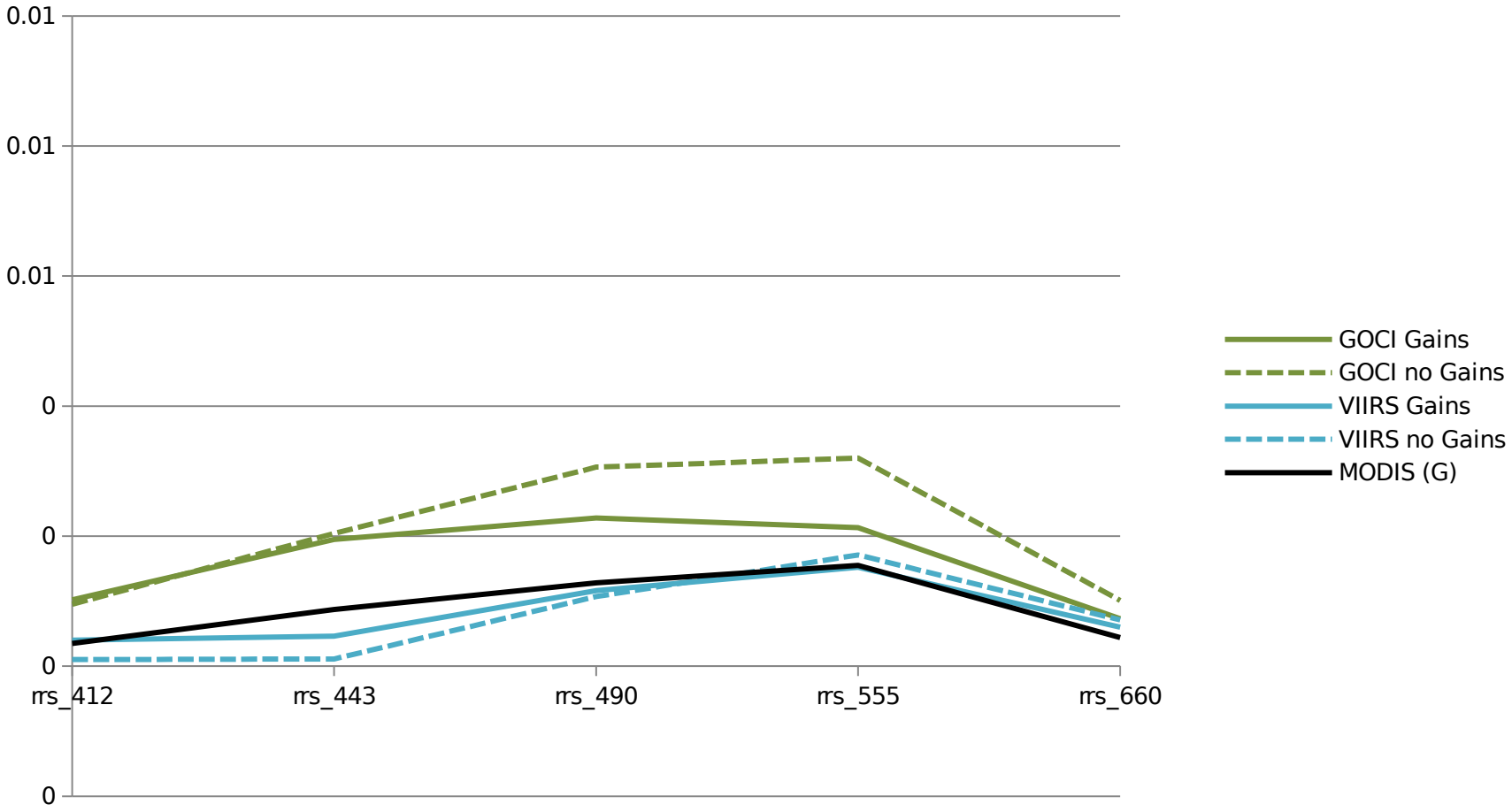
Evaluation of GOCI, MODIS, and VIIRS Imagery

JD 118 2012 Spectra – Gageocho and Ieodo



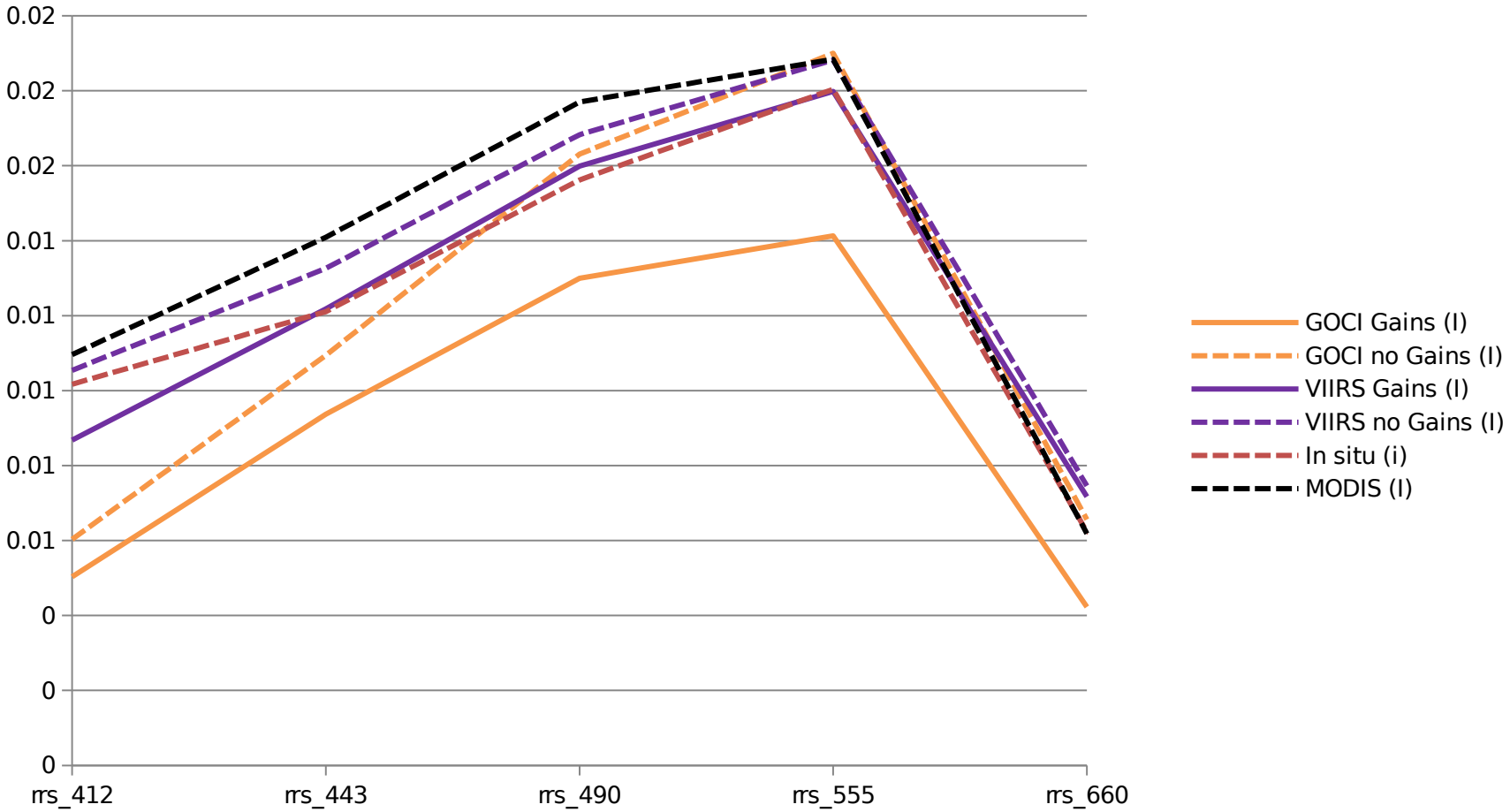
Evaluation of GOCI, MODIS, and VIIRS Imagery

JD 277 2013 Spectra – Gageocho



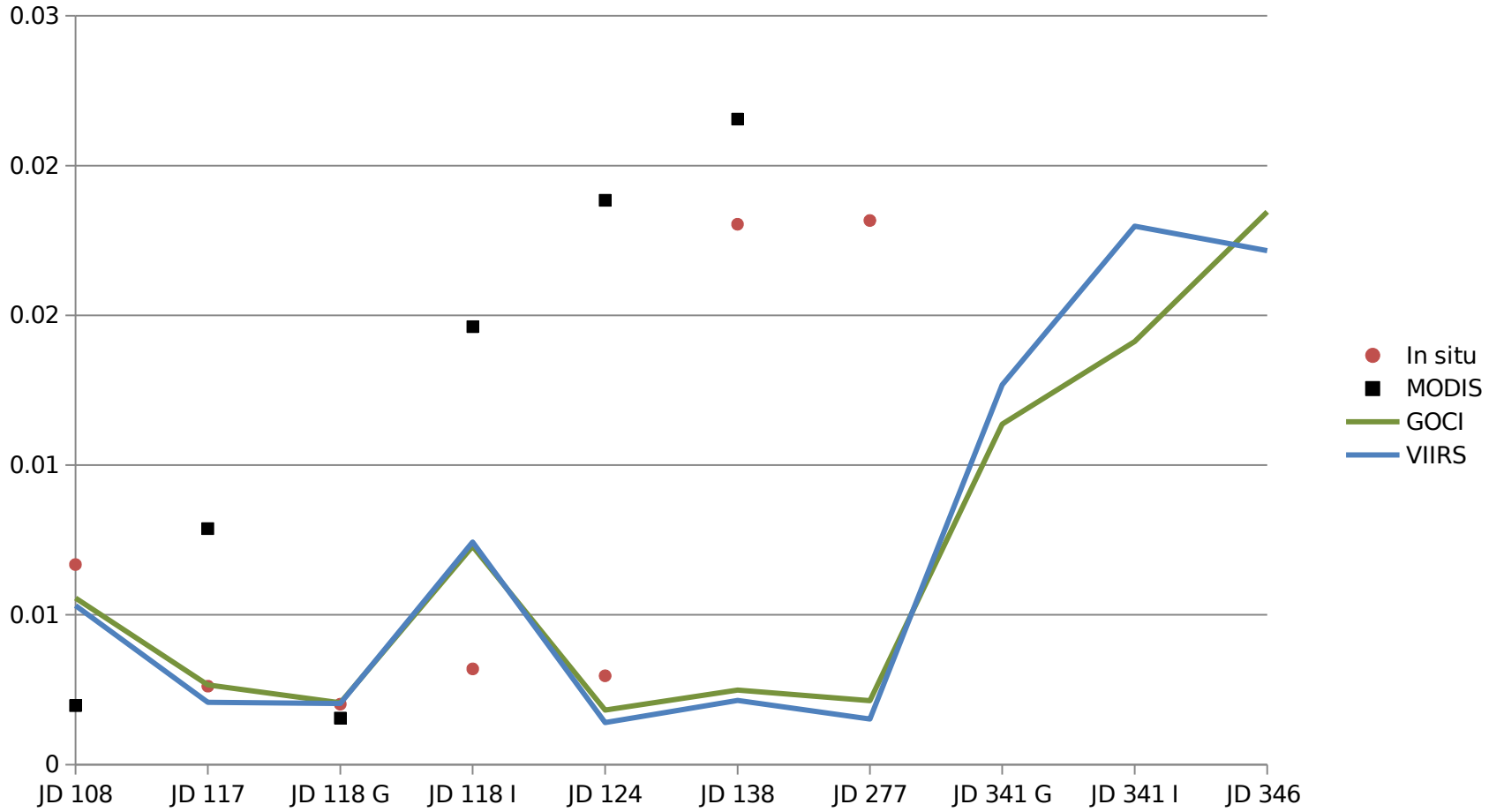
Evaluation of GOCI, MODIS, and VIIRS Imagery

JD 341 2013 spectra – leodo



Evaluation of GOCI, MODIS, and VIIRS Imagery

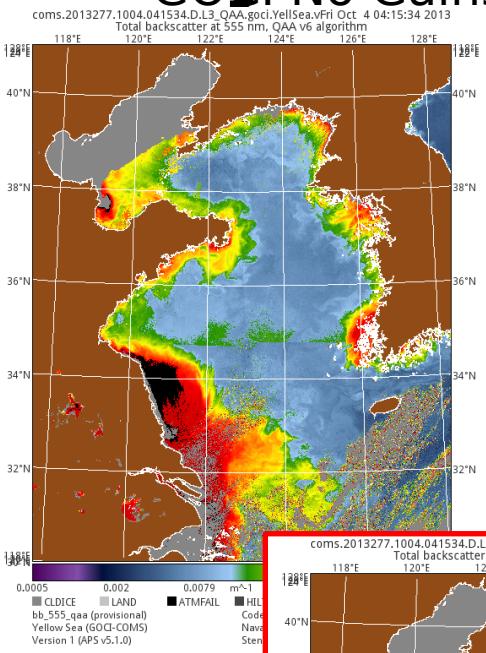
All sensors (4Z) time series - rrs 550



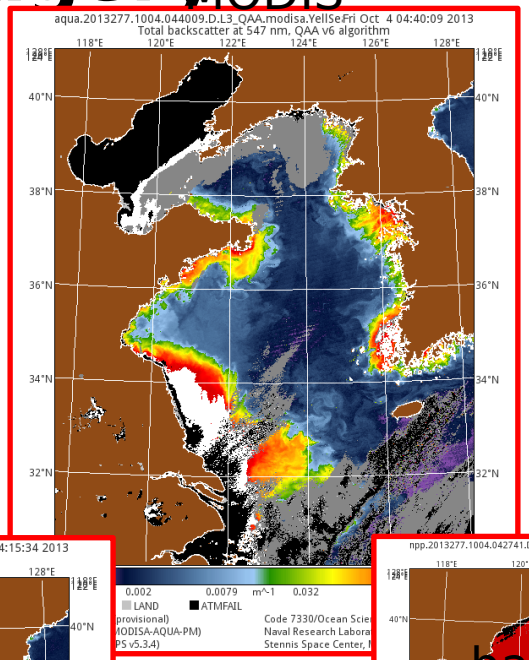
Evaluation of GOCI, MODIS, and VIIRS Imagery - bb 551nm

JD 277 Imagery

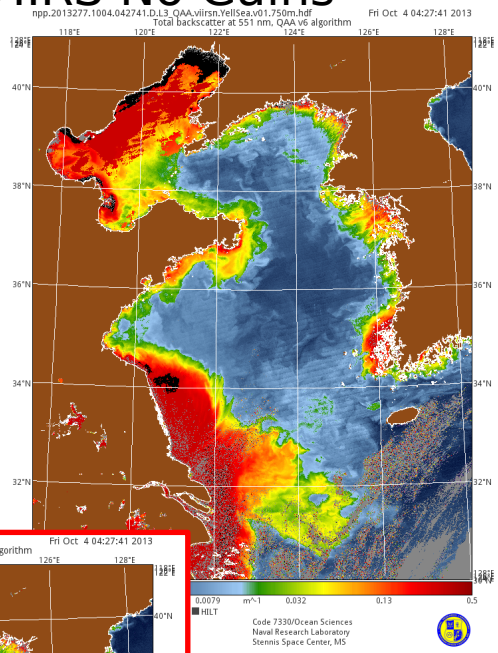
GOCI No Gains



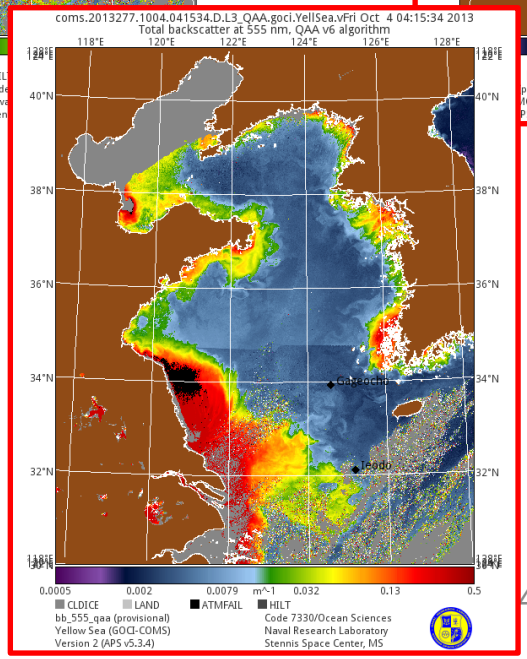
MODIS



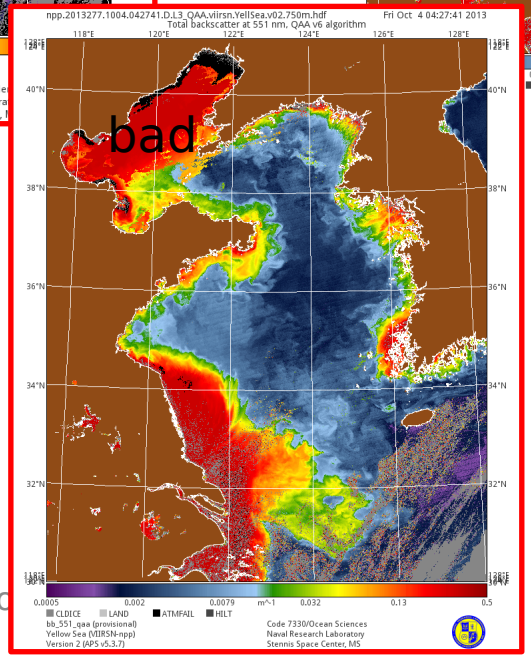
VIIRS No Gains



GOCI Gains

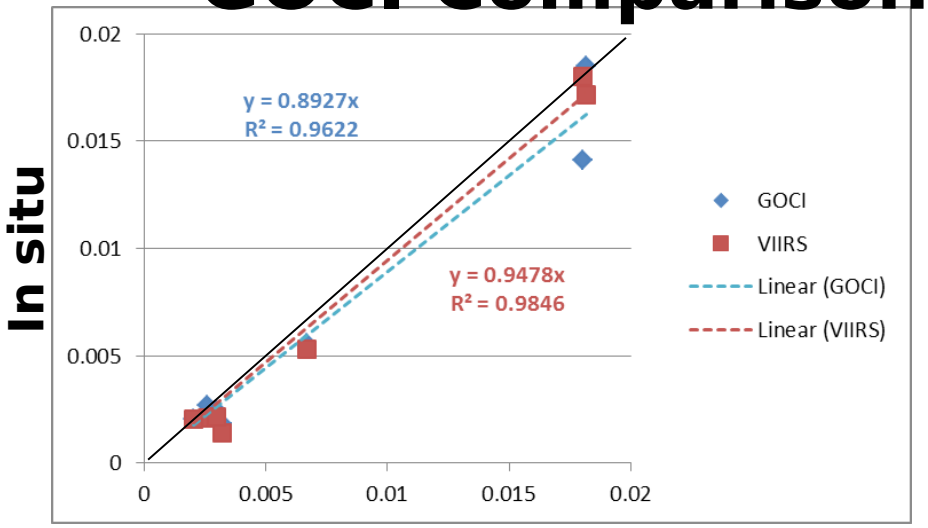


VIIRS Gains

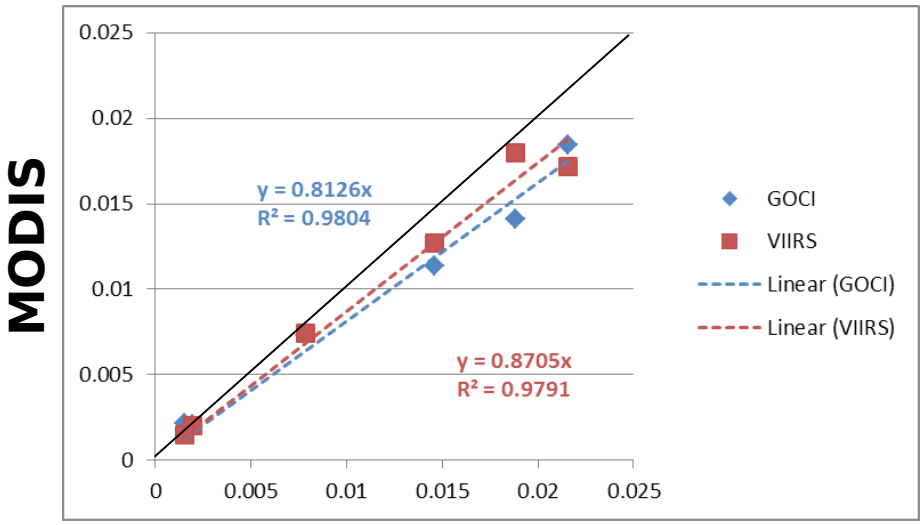


Evaluation of GOCI, MODIS, and VIIRS Imagery

rrs 555: MODIS, in situ, VIIRS, and GOCI Comparison



GOCI - VIIRS



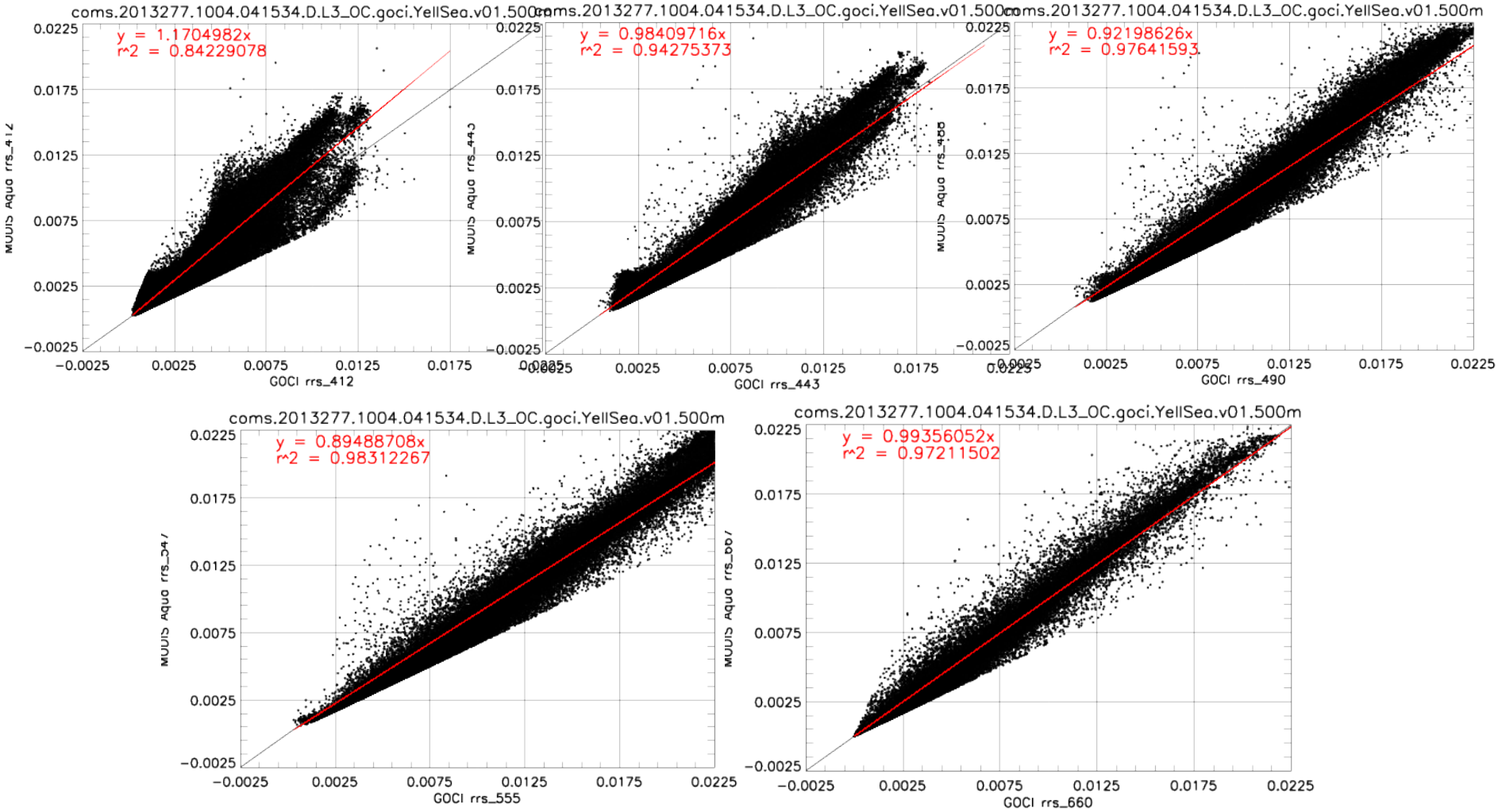
GOCI - VIIRS

rrs 555	Slope	R^2
GOCI In situ	0.893	0.962
GOCI MODIS	0.813	0.980
VIIRS In situ	0.948	0.985
VIIRS MODIS	0.871	0.979

Seems MODIS Is a lower in coast NASA coming Out with new Calibration in Mid March.

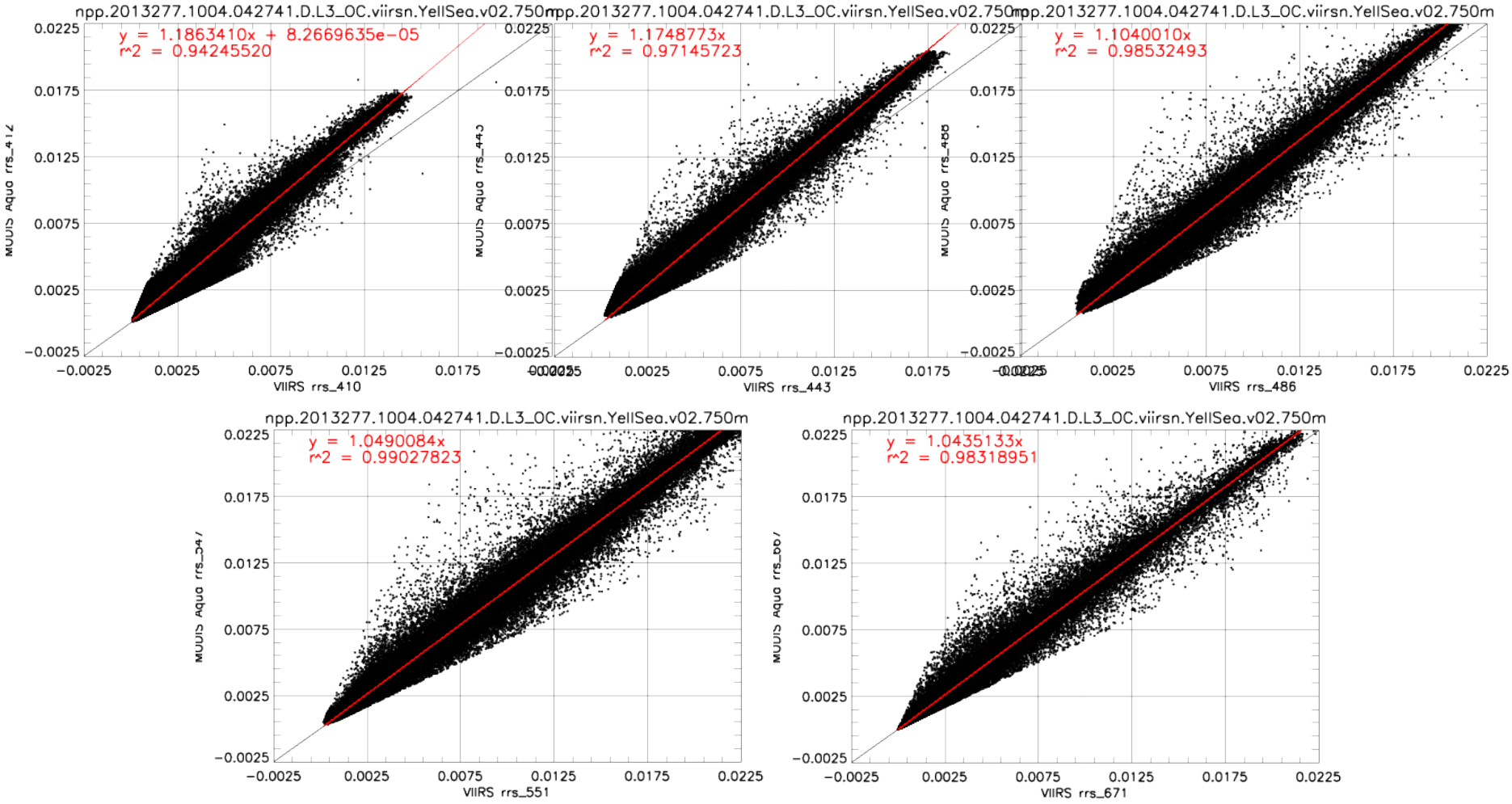
Evaluation of GOCI, MODIS, and VIIRS Imagery

JD 277 MODIS – GOCI Image Comparison



Evaluation of GOCI, MODIS, and VIIRS Imagery

JD 277 MODIS – VIIRS Image Comparison



JD 277 Full Image comparison to sites from multiple images - R^2 Values

R^2 Values	Multiple Images, Single Sample		Single Image, all samples	
Channel	GOCI-MODIS	VIIRS-MODIS	GOCI-MODIS	VIIRS-MODIS
412	0.539	0.970	0.842	0.942
443	0.835	0.993	0.943	0.971
490	0.930	0.992	0.976	0.985
555	0.980	0.979	0.983	0.990
690	0.959	0.914	0.972	0.983

ed to MODIS, VIIRS doing a little better overall than GOCI (mair
e sensors consistent.

Conclusions

- MODIS, VIIRS, and GOCI remote sensing reflectances compare favorably in the East China Sea
- Application of Gains to GOCI and VIIRS visibly improves data
- Application of Gains lowers rrs in most cases
  - GOCI 412 and 443 channels appear to be exceptions
- Data from single points and imagery show similar statistics, except at GOCI 412 and 443 Channels
- Overall, the comparison between the sensors are good

Future Efforts

- Investigate application of green-water gains for VIIRS and MODIS
- Attempt to acquire more in-situ data and re-analyze the rrs data
- Analyze the Inherent Optical Properties.